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- **SOUL AFFRIGHTED**
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- **THE VOLUNTEER**
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EDITORIAL

This year, for the first time in quite a few years, **AMAZING STORIES** was on the Hugo nominations ballot—along with Ursula K. Le Guin's *The Left Hand of Darkness* and Greg Benford's "Deeper Than the Darkness," a coincidence of titles—and although we did not win (we came in third), I consider our nomination a good omen for times to come. The Hugo was awarded this year for the achievements of 1969, and we had only begun making improvements in this magazine that year.

Although Greg's story did not win in its category (and wasn't published here either for that matter), its nomination also says good things for our science columnist's future in the field.

Mrs. Le Guin's novel, however, *did* win the Hugo for Best Novel, and that

award follows on the heels of the Science Fiction Writers of America's Nebula award for Best Novel, a double win. You'll recall that in the July, 1969 issue of this magazine I said of *The Left Hand of Darkness*, it "has to be one of the year's best books," so I feel a certain proprietary pleasure in its winning both awards.

I feel even stronger pride, however, in the fact that beginning in our next issue, we will be publishing Mrs. Le Guin's *next* awardwinning novel, "The Lathe of Heaven."

I'm not going to tease you with come-on blurbs; I'll simply say this: "The Lathe of Heaven" is a 70,000-word novel by Ursula K. Le Guin, and it's as fine a work as any she's written. We'll be publishing it in two parts, as is our policy. You won't want to miss it.

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AMAZING STORIES

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ALMOST HUMAN

J. T. McINTOSH

Illustrated by JEFF JONES

Prejudice is something that can't be legislated from a man's heart... but experience, personally meaningful experience, can sometimes tip the scales. For Vince Harkins it wasn't so much his experiences with androids that dispelled his prejudice against them, but his experiences with his fellow humans...

AS THE ALARM clock shrilled and Vince opened his eyes reluctantly he wondered, as he did every morning, what the weather was like. Then he realized, as he realized every morning, that there was no weather. He was in a space station and the nearest weather was billions of miles away.

Twenty minutes later, when he staggered into the main observation room, the one full of dials and windows, Sam looked up and pantomimed astonishment.

"Well, well," he said. "Surprise, surprise."

"What's surprising, what's surprising?" Vince inquired sleepily.

"You turning up for duty. It's only eight o'clock."

Never at his best within two hours of getting up, Vince blinked at him like an owl. "I'm due on at eight."

"I know, but when did you ever make it before? What was the matter—insomnia?"

Vince yawned. "Cut the sarcasm. Anything happened?"

Sam horselaughed. "In Observatory

6? What did anything ever happen?"

Automatically Vince wandered in the direction of the controlboard. It was part of his duty to cast an eye over the meters on coming on duty, even when the eye concerned was more than half shut.

"Of course, you'd better check for yourself," said Sam tartly. "When I say that nothing worth reporting has happened, that's only my infantile assessment of the situation. And I haven't checked everything more than fifteen times. To be on the safe side, you'd better look everything over and see what I've missed."

Vince sighed. "Sam, you're not a bad guy, but if you had three shoulders you'd have chips on all of them. Now leave me alone for a couple of hours until I come to myself, will you?"

"And of course there's no reason why I should have a chip on the shoulder."

"Sure there is. You're an android, and you think the whole galaxy is against you."

Sam was silenced. By the time he

had found a comeback, it was too late.

Vince sighed again. Weeks could pass without any mention between them of the word *android*. Likewise, if Sam had been a cripple, that wouldn't be mentioned. But if a cripple challenged you, said *well, why can't I run as fast as you?* he was forcing you to tell him.

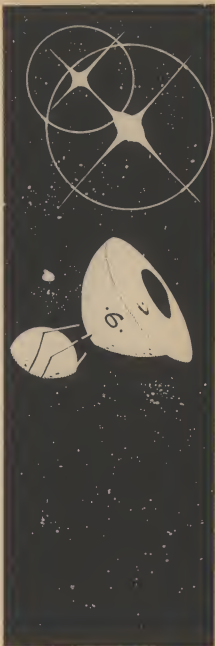
Sam didn't have to have a chip on his shoulder, especially with Vince. Vince treated him, thought of him, as his observatory mate, no more and no less. But when Sam bothered him, needled him, that was because he was an android, because he felt inferior, because he saw distinctions which didn't exist, and Vince didn't mind saying so.

Sam dropped into an armchair in moody silence. Vince yawned again and went to the big windows.

The line of observatories between the systems of Aram and Quint had many useful purposes, and some of them entailed excitement at times. But for the most part observatory duty was somewhat lonelier and less eventful than lighthouse-keeping had been centuries back.

The routine readings and sightings were just that—routine. About once a year an observatory officer got a reading or observed something that was markedly different from what he expected. When that happened he checked his instruments and generally found a fault somewhere. However, the rare exceptions constituted one of the reasons for the existence of the chain of observatories.

Another was the fact that ships sometimes ran into trouble and needed



a refuge. This was equally rare. Not that spaceship disasters were unknown—they were not. But most things that went wrong went wrong in take-off or landing, or near a powerful gravitational field—not in the vast emptiness between the systems of Aram and Quint.

Still, the *Janus* disaster was still remembered with horror, nearly a hundred years later. Had there been emergency stations in space then, not one of the 132 men, women and children who died need have died.

More recently, indeed within the last three months, the *Cymbeline* had cracked up in the same region of space. But everybody in Aram and Quint knew the story of the *Janus* and hardly anyone had ever heard of the *Cymbeline*—simply because not one of the *Cymbeline's* passengers or crew had suffered more than delay and inconvenience. They had had to wait a few weeks jammed together in Observatory 17, that was all. So the *Cymbeline* did not pass into history; her crack-up was scarcely even big news. It needed a long death-roll to make a memorable disaster.

"Are you trying to tell me," said Sam at last, "that being an android isn't a reason for having a chip on your shoulder?"

"I'm not trying to tell you anything."

"You don't know . . . how could you know? When it comes to a plain choice between an android and a human—"

"Nobody's allowed to discriminate. There's a whole code of laws against it."

"Anybody can get round that," Sam sneered.

"Listen," said Vince, "I used to know a girl."

"Congratulations."

"She was a rather pretty girl, with a quasi-sensational figure—"

"What do you mean by a quasi-sensational figure?"

"Give me a chance and I'll tell you. This girl was always entering beauty contests. And she was always the most striking girl in the lineup. Incredible waist. Bust that looked as if she had an invisible bra, even when you could see she wasn't wearing one. Belly as flat as a board, but shaped—"

"Don't," Sam protested, moving uncomfortably.

"Anyway, despite all that, she'd never have won any major contest in a million years. There was something funny about her eyes. Her neck was thick. Her calves weren't shaped right, and she had thick ankles. Because she was striking, she was always placed about third. Because she didn't have the looks to win, she never won anything. But she had an alibi."

"Don't tell me—she was an android."

"No, she wasn't. But she was foreign. She was born on some outback planet, I forget which. And every time she was placed behind two or three other girls, she's say bitterly: 'What can you expect when you're a foreigner?'"

There was a pause. Then Sam said: "That's supposed to be me, isn't it?"

"Well, I thought it was relevant."

"I'm a dud, and I blame it on the fact that I'm an android?"

Vince breathed deeply. Trust Sam to get hold of the wrong end of the stick.

"Hell, no. What I'm getting at is—"

He stopped as the detection bell rang.

II

ALL ELSE instantly forgotten, they looked at it with mild interest and slight pleasure. It was the Aram bell. The detected ship must therefore be traveling from Aram to Quint. There was little likelihood that she was a ship from outside the twin system.

"Must be somebody in a hurry," Vince remarked.

"How do you make that out?"

"She's taking the high-velocity route close to Quint. Nobody on any other line of flight would pass anywhere near here."

"Huh? Oh, yes," Sam said vaguely. It was plain that he still didn't follow, but wouldn't admit it. Now Sam would cover sheet after sheet with calculations until he had worked out exactly what Vince was talking about and whether he was right or wrong.

Vince's guess was merely that with the planets in their present relative positions, any ship taking this course must be headed for Quint IV, must intend passing dangerously close to the sun Quint, and must therefore be on a wasteful route involving high velocity past Quint and then colossal braking in the last few million miles. It would be quick, but it would entail the consumption of twenty times as much fuel as the more conventional route.

Some of the big observatories along busy Quint-Aram shipping lanes had a crew of twenty or more. Others, like

Observatory 6, which were seldom likely to see a ship, had to get along with two or three men relieved once a month. The distances involved being so vast, observatory men worked a nine-month schedule—a month in a spaceship, a month on duty, a month traveling to another observatory, another month's duty, and so on—and then had three months off.

It was a routine which did not suit many normal men—or androids, for that matter.

Sam got up and silenced the bell. "Shall I call her up?" he asked.

"Better wait an hour or so. A ship that's only just entered extreme detection range is too far out for decent radio communication. No hurry, anyway—she'll be in radio range for a week now."

"Sure," said Sam. "She may have carrier-beam radio, of course."

"Unlikely."

"Oh, sure. Anything I suggest is obviously unlikely."

Vince let this pass.

Ordinary radio had never been much good over galactic distances, being far too slow. And it was only recently that anything faster had been developed. Along constantly-maintained carrier beams, messages could now be sent pick-a-back, virtually instantaneously over distances of a light-year or so. For the compact Quint-Aram double system, this was satisfactory. For the wide-open spaces of the galaxy in general, something still better was still needed.

Even after Vince and Sam started calling the unexpected ship, now well inside normal radio range, over an hour

passed with no reply. Sam recorded a call signal and let it play back endlessly by means of a loop cassette.

Vince was by this time fully awake.

At last an answer came in, thin but clear. "This is yacht *Sonia*. Yacht *Sonia* calling Observatory 6. Have you anything to say, Observatory 6, or are you just passing the time of day?"

Sam and Vince exchanged glances. "Girl radio operator," Vince commented, with rising interest. "Nice voice, too. I wonder what she looks like?"

"Yacht?" said Sam, puzzled. "Out here?"

Vince took the microphone. "Just passing the time of day," he said pleasantly. "But naturally we're interested. What's a yacht doing out here?"

Ordinary radio being in use, a long pause ensued.

"Might not be a girl," Sam observed. "Might be a man with a high voice."

"It's a girl all right," Vince said.

Sam opened his mouth to argue, but thought better of it.

He was well aware that he was often senselessly argumentative. Vince was nearly always right, that was the trouble. In order to be right and make Vince wrong, Sam would gamble recklessly. He would be delighted, triumphant, if it should turn out that the *Sonia's* radio operator was not a girl but a man with a high tenor voice. For once he'd be right and Vince wrong.

At the same time Sam knew perfectly well that there was scarcely one chance in ten that the voice they had heard was a man's. It was childish

to act this way, and he knew it, but couldn't help it.

The voice sounded again at last: "I'd have thought it was obvious what a yacht was doing out here—traveling from Aram to Quint. Why, do you mind?"

Vince raised his eyebrows at this reply. "No, I don't mind," he said mildly. "But we thought you'd want to talk. Radio operators out here usually do. Vince Harkins and Sam Brent here. You'll be in radio range for a week. Might as well make the best of it, huh?"

He stopped, switched off the microphone and moved at once to the carrier-beam installation.

"What are you doing?" Sam demanded.

"Just checking . . . Observatory 6, Vince Harkins, calling Aram Space Control. Observatory 6 calling Aram Space Control."

This time the reply was almost instantaneous. "Aram Space Control. Go ahead, Observatory 6."

"A ship identifying herself as the yacht *Sonia* has just entered detection range, en route for Quint. Do you have any information?"

"What sort of information?"

"Check the name, will you? See if anybody's interested."

"What do you mean, interested?"

It was an android lie he was talking to, an android like Sam. He wanted to be sure. Like Sam, he always wanted to be sure. Before androids existed, people with an inferiority complex had had that trouble—they had to be *sure* so that nobody could come back on them later. Before they did anything they

wanted a signed statement that their course of action was approved. Before they failed, as they always expected to do, they had to provide themselves with a cast-iron exoneration. Not just *I didn't know the gun was loaded*, but *How could I possibly have known the gun was loaded, having every reason to believe the reverse?*

Androids felt inferior because they hadn't a father or a mother and had not, strictly speaking, been born.

Vince said patiently: "Just find out anything there is to find out."

"You're making that an official request?"

"Yes, I'm making that an official request."

"Okay. We'll call you back. Out."

For a moment there was silence in the observatory. It would be some time before *Sonia* would reply.

Then Sam said: "Go on, say it."

"Say what?"

"That was an android."

"I guess so."

"Why do you guess so? Because unlike a human being with a soul, he acted like a robot. *Tell me what to do. Give me orders.*"

"Sam," said Vince with a sudden edge to his voice, "I'm fed to the back teeth of this particular inquisition. If you mention the word android again, I shall personally take you apart with my bare hands."

He had struck the right note this time. Sam grinned. Vince was small, unusually ugly and not very strong. Sam, since chance played no part in his physical makeup, was tall, handsome and strong as an ox. One field where there *was* discrimination against

androids was sport, particularly contests of strength. No matter how strong the strongest man in the galaxy was, an android could be made who was stronger.

The loudspeaker came to life again. "Sorry. I didn't mean to be rude. I'm Freda Jordan. Pleased to meet you, boys, and we'll talk later. But I'll have to sign off now. I've got things to do. 'Bye.'"

And they heard the transmitter being shut off.

"Well," said Vince, "you could hardly accuse her of being man-crazy. Or a chatterbox."

VINCE ENTERED the observatory at twelve minutes after eight.

"That's better," said Sam. "More like yourself. You had me worried."

"No messages?" Vince yawned. "Either from *Sonia* or Aram Control?"

"Nothing."

It was not surprising that *Sonia* had not called again. Freda Jackson had not shown herself eager to talk. Besides, a ship in the void between systems would be unlikely to have a radio operator on duty twenty-four hours a day. Her last message had come through some sixteen hours ago, just before Sam hit the hay. Since then Vince and Sam had each done eight hours' solo duty. The natural time for Freda Jordan to call the observatory, if she called at all, would be twenty-four hours after the first radio contact.

It was, however, very surprising indeed that Aram Space Control had not called back yet. They must know *something*. Even private yachts were

still ships, and Space Control was supposed to know all about all ships everywhere.

"If there's nothing from Space Control in the next hour I'll call again," Vince said. "I smell something, and it isn't attar of roses."

"What's to smell?" Sam demanded. "The girl on the yacht doesn't particularly want to talk. What's strange in that?"

"You know what's strange in that, Sam. In a crowded hoverbus people often don't want to talk. But in the middle of umpteen trillion cubic miles of nothing at all, nearly everybody wants to talk—unless he, or she, has something to hide."

"Something to hide!" Sam scoffed. "In that case, why come near an observatory at all?"

"There's no feasible course between the two systems that doesn't cut through the detection area of some observatory . . ." Vince stopped as the loudspeaker, left tuned to the *Sonia*, suddenly came to life.

"*Sonia* calling Observatory 6. Freda Jordan calling Vince and Sam. Sorry I was abrupt yesterday, boys. I guess you're due an explanation. You see, the others on board are in light-sleep, and I'm the only one awake."

Vince frowned thoughtfully. Lightsleep for a fast trip between Aram and Quint? It was not unknown, but it was very unusual. Suspended animation always carried a certain risk. Stopped hearts sometimes didn't resume beating again as they should, and even if they did, a week of hardly enjoyable convalescence was obligatory. The risks involved in

lightsleep or even deepsleep were cheerfully accepted in journeys taking two years or more, but it was rare to court them merely to avoid the boredom of a three-month or six-month space passage.

Then, too, it was unusual to leave just one person awake. People in deepsleep for the really long journeys were revived automatically. From lightsleep, however, they were revived by crew members left awake for that purpose. And one person left alone in a spaceship for months on end could fall and break a leg, could become ill and die, could even go mad.

The girl was speaking again. "This is Brett Davenport's yacht—you know, the movie star—but he isn't along on this trip. He lent the yacht to some friends. As a matter of fact, I scarcely know who they are. I was hired as copilot, but since the pilot's health isn't too reliable, I was left awake instead of him. Now I've told you something about me, let's hear about you."

Vince's frown had not lifted. For once, less than half an hour after rolling out of the sack, he was fully awake.

Not only was Freda Jordan's story unconvincing in several particulars, her manner of telling it was odd. First she had seemed anything but pleased to pick up Observatory 6's message. Then she had tried to cover this up but signed off nevertheless for seventeen hours. Now she told a stilted story which sounded more like an attempted explanation than ordinary radio chit-chat. If you had nothing to hide, you didn't have to explain yourself unless you wanted to. Only if you felt there

were grounds for suspicion did you try to explain questions away before they were asked.

Vince answered easily, however: "You want to know about Sam and me? Well, we're just a couple of observatory men with time on our hands—what observatory men haven't? We haven't seen a girl for months, so naturally . . ."

He went on talking casually, trying to put the girl at her ease. When you were very curious, the worst thing you could do was make it too obvious you were curious. If you merely made casual smalltalk, the other party had to talk freely or admit plainly that there was something to hide.

He stopped after a minute or so. There was still a long radio delay, and in such circumstances you didn't so much converse as send each other messages.

"There you are," said Sam, when Vince switched off the microphone. "Her story makes sense. Satisfied?"

"No," said Vince. "I'm going to call Space Control again."

"Now?"

"No. First, I'm waiting to see how long she takes to answer. I'm going to time the delay so that I'll know when she hesitates."

"For Pete's sake!" Sam exclaimed. "Just because a ship comes into detection range when you don't expect any ship, that doesn't mean she must be smuggling dope. And why shouldn't a yacht have a girl co-pilot? Happens all the time. People don't like women captains, but so long as a man is in charge even the spacelines use women co-pilots."

"Sure," said Vince absently.

The delay was nearly an hour, little less than it had been the previous day. Evidently the *Sonia's* course was not going to bring her very close to the observatory.

This time the girl said: "Pity we haven't carrier-beam radio. I can't get used to conversation at this range—I always forget what I said last time. We won't be able to see each other either, even when I get closer. The vision unit on this ship is the old scanning model, and I guess you have the new twenty-per-second system. Look, I've got jobs to do. Call me back in about twelve hours, will you?"

"Well?" said Sam challengingly, after she had signed off. "What's she said wrong this time?"

"If she was hired as a co-pilot," Vince said, "she must be some kind of professional spacegirl. In which case she'd be perfectly used to radio communication with a long time lag."

"On the other hand," said Sam triumphantly, "if she *weren't* a professional spacegirl, would she know all about carrier-beam radio, and scanning vision, and that we operate on the twenty-per-second system?"

"That's a point," Vince admitted, crossing to the carrier-beam installation. "Observatory 6, Vince Harkins, calling Aram Space Control. Observatory 6 calling Aram Space Control."

Again the reply came at once. "Aram Space Control. Yes, Observatory 6. We haven't forgotten about your query. We're still checking."

"Still checking?" Vince echoed.

"Yes. You're right . . . there is

something funny about the *Sonia* situation. We didn't call you back because the New Athens police haven't finished their investigations."

"Police?"

"A man's been killed. He hasn't been identified yet, but it seems very possible that the girl on the *Sonia* is mixed up in the murder. Have you got her name yet?"

"Freda Jordan."

"Freda Jordan . . . I'll pass that on, for what it's worth. If she murdered someone, it's not likely she'd give her right name. She *did* give the yacht's name, though."

The voice this time was different, more assertive, more definite. Vince didn't say anything, but he knew just as he had known that the last time he was talking to an android, this time he was talking to a human.

"Anyway," Aram Control went on, "keep her talking and find out all you can, but don't tell her you've been in touch with Aram. When we get more information we'll contact you again. Meantime, concentrate on finding out—without alerting the girl—whether she's human, android or robot."

Well, it wasn't Sam who had mentioned the word android this time. Vince didn't have to look at him to know things were going to become difficult again.

"Sure," said Vince. "Can you tell me why?"

"The police haven't given us details, but they say if this girl on the *Sonia* is human, there probably won't be any charges, whatever happened. If she's a robot, she may be the murderer but the

real killer must be somebody else, of course. If she's an android, she's a killer on the run. What you're to do in that case we haven't been instructed yet, but I'll tell you when we know."

"Thanks. Out," Vince said.

After he had switched off, there was a long pause. Then Sam said: "So. Human justice at its best. If she's human, she's innocent. If she's an android, she's guilty. A few hundred years ago, back on Earth, justice used to work the same way with whites and blacks. Now it's humans and androids. That's progress."

"No need to glare at me, Sam," said Vince mildly. "It's nothing to do with me. For that matter, it's nothing to do with you either what eventually happens to the girl. All we've been asked to do is find out whether she's human, android or robot."

"That's all," said Sam, and laughed grimly. "What else matters?"

VINCE WAS GLAD when Sam went off duty and left him on his own. At the best of times Sam's chip on the shoulder was very much in evidence. When he really had something to be aggrieved about, it wasn't a chip, it was a boulder.

It was six hours since Freda, claiming for the second time that she had mysterious "jobs to do," had signed off. Could she really have anything to do? Usually time hung heavy on your hands in space. If you were the one person awake on a ship of passengers in lightsleep, you could do everything that had to be done in half an hour out of every twenty-four

without straining yourself.

If Freda was a killer, the chances were that there were *no* passengers on the yacht in lightsleep. She had invented them because no girl would ever jet from Aram to Quint entirely alone unless to set up records or to escape from justice.

Unprompted, she had volunteered the information that the yacht's vision unit was one of the obsolescent scanning models. That seemed like countering an expected thrust—explaining in advance why it would be quite impossible for the two men in Observatory 6 to see inside the yacht.

Seeing her wouldn't enable Vince to tell whether she was human or android, though it might help. But it would show him whether she was a robot or not.

Did the yacht have twenty-per-second vision? Did her statement that she had not mean that Freda Jordan was a robot?

Robots could kill only under instruction, and only then if their built-in relays had been tampered with illegally. (Of course, if you were prepared to commit murder, the crime of tampering with a robot's relays was a small one. If a man shot somebody dead, it wouldn't bother him unduly that he didn't have a license for the gun.)

Why, if Freda was a robot, had she not been instructed to destroy herself after killing the unknown victim? Simple—because the police would then look for the real killer, whoever had used her as a weapon. The reason for her flight (if she was a robot) was to

set a false trail.

And it would make a lot of sense, if you adjusted a robot to make it do your killing for you, to send it on a voyage from Aram to Quint. You might even *want* it to be caught and questioned—after its flight and the ensuing hue and cry had given you plenty of time to cover your own tracks.

Anyway, Vince proposed to call Freda Jordan's bluff. And he was glad to have the chance to do it while Sam wasn't around.

In the ordinary way no observatory equipped with the new vision system would have any means of making visual contact with any ship which only had the old scanner unit. However, Vince at one time had been a radio technician. He thought he could fix something up which would enable him to see the girl. Two-way vision was not necessary.

As he worked with radio spares, whistling softly, he decided that the way to handle the situation was to present the girl with a *fait accompli*. To warn her that he was making a scanner vision receiver would only give her a chance to find that there was something wrong with her transmitter.

Vince rather hoped she was a robot. That would limit Observatory 6's part in the affair to mere elimination. The New Athens police would have to think again. And there would be no trouble with Sam.

If she were not a robot, things could become very unpleasant, whether she was guilty of murder or not.

Meantime, however, Vince went on the comfortable assumption that

"Freda Jordan" was a mere machine. She could be—machines often had to be given voices, and female voices were more popular than male voices. They were seldom given human appearance, since it was difficult and expensive to make them look passably human and virtually impossible to make them convincing enough to fool anyone for more than twenty seconds.

When he was ready, Vince called the yacht again. He didn't bother with radio routine, which always seemed pretty silly when there were only two radio installations within screaming distance.

"This is Vince. Freda, I think I've managed to fix up a scanner vision unit that'll work. Switch yours on and let's have a look at you. I hate to think how long it is since I saw a girl . . ."

He stopped because at that moment, rather inopportunistically, the carrier-beam warning buzzer went. Vince switched off the transmission a second too late, shrugging. If Freda heard the buzz and guessed what it was, it couldn't be helped. You couldn't run after a transmitted noise and stop it going any further.

"Vince Harkins?" said Aram Space Control. It was the human operator's voice. "Good. I wanted to catch you on your own. Your mate is an android, of course . . . Can tell you more now and will do . . . The murdered man was Tom Purchase, a friend of Brett Davenport from 'way back. Davenport's the movie star who owns the yacht. Purchase was a small-time actor, not in Davenport's league any more, but Davenport had found him a job in Quint for old times' sake and

lent him the yacht to get there. Sonia was checked out for the hop from Aram to Quint.

"Now, about the murder. From what the police have been able to piece together, this Tom Purchase planned to take one girl along with him and that was all—co-pilot, cook, companion and bedmate all in one. He was such a guy for the girls, or thought he was, that the New Athens police are not quite sure which one finally arrived on Davenport's private field. What they do know is that she shot him practically the moment the yacht took off and pushed him out in space."

"How?" Vince said. "How do they know? You're not going to tell me a body dumped in space has been found."

"That's exactly what I am telling you. The girl was in too much of a hurry. She pushed out the body only a few hundred miles up and it went into orbit. It was detected and recovered by Meteorite Control."

"I don't quite get the point," Vince remarked, "of the question whether she's human, android or robot."

"Don't you? I'd have thought it was obvious. The New Athens police are certain no *person* was with the girl—well, there wouldn't be, would there? But there could have been a robot, a driver, escort or whatever, in which case what happened was that the girl sent the robot to Quint in the yacht, laying a false trail while she quietly disappeared here on Aram."

"She may have gone in the yacht with the robot."

"She may have, but is it likely? So if you find the yacht is being piloted by a

robot, let it go on and Quint IV Space Control will arrest the ship and hold the robot. Meanwhile the New Athens police will hunt for the woman."

"Okay," Vince said. "That's if she's a robot. Suppose she's not?"

"Well, the situation is that she shot Purchase the moment the ship took off. So it's a million to one that she wasn't on the yacht voluntarily. I mean, if she agreed to go along she might have quarreled with him and shot him weeks later, but not within seconds of takeoff."

"I'll buy that," Vince said. "It looks like self-defense. So what's the difference whether she's human or android?"

"You know the answer as well as I do."

"All the same, spell it out for me."

"Davenport is going the limit on this. And he's neither unknown nor without influence."

"I asked you what's the difference whether she's human or android."

"Hell, don't be naive. If she's human, no jury would ever convict. If she's android, your instructions are to blow the yacht out of space."

"What!" Vince shouted.

"That's what I'm told to instruct you," said the Space Control operator defensively. "I know it's awkward, your mate being an android. That's why I wanted to get you on your own."

"But . . . hell, you can't mean it. No trial? Just 'Blow the yacht out of space'? On my guess that the girl on board is an android?"

"Well, let me tell you how the police figure it. First of all, Davenport is quite happy to have the yacht destroyed to



make sure this doll doesn't get away with the murder of Purchase—"

"It wasn't murder. From what you tell me, it was plain self-defense."

"That's not how a court will figure it . . . if she's an android. Look, I don't have to argue with you, Harkins. You've got chaser missiles, haven't you? You're supposed to use them when you're told, aren't you? Well, you're told. The rights and wrongs of the matter aren't your concern. If you think the girl's human or a robot, let her go. But if she's an android she's dangerous and you've been instructed to blow up the yacht, is that clear?"

"I hear you," said Vince expressionlessly.

"Okay, then, I've told you all I know and now it's up to you."

"Wait—is there a Freda Jordan?"

"We don't know yet. It doesn't affect the issue whether the girl on the yacht is Freda Jordan or Philomena Bracegirdle, what matters is whether she's—"

"That's a matter of opinion."

"Anyway, I've briefed you. There's nothing more to tell you and I'm signing off."

Aram Space Control did sign off.

Vince swore. But swearing somehow did nothing to relieve his feelings.

FREDA TOOK only half an hour to answer this time. And her reply came in vision as well as sound. If she considered stalling, she decided against it.

The picture built itself up slowly on the screen, with much distortion at first. But it was clear almost from the

beginning that Freda was no robot.

"I guess I should be flattered," she was saying. "You must have gone to a lot of trouble to fix up a scanner unit. Maybe you just had nothing better to do?"

"It was worth it," said Vince, although she wouldn't hear him for fifteen minutes.

Unaware of what he had said, she went on: "I guess in honor of the occasion I ought to have gone and dolled myself up . . ."

Yes, she ought, Vince thought. She was a pretty girl, and as the picture became clearer and sharper it revealed not flaws but the absence of such. Surely any pretty girl, putting herself on view for the only time in several months, would change from overalls to an attractive dress, fluff up her hair, at least put on makeup? He waited for her excuse why she had not done so, but none came.

Instead she said: "Well, you must have had a good look at me now. No doubt you'll have some comment. You usually do."

And she switched off.

For just a few seconds Vince had thought he'd be able to report to Aram Space Control, with a clear conscience, that in his opinion the girl was human. But then he ceased to be sure . . .

When Sam appeared, there had been no further communication with *Sonia* and nothing more from Aram. Expressionlessly, Vince told him what Space Control had said.

Sam breathed hard and deep. Then he said with surprising calm: "What else would anyone expect?"

"It wasn't what I expected."

"Sure, you like to pretend you'd give an android a break. Well, now you've got a chance to prove it."

"I've got no chance. I haven't been given any choice. I've been given an order."

"Might have known," Sam said bitterly. "In theory Vince Harkins is fair and just and noble—but in practice he's a good little pure-bred human who can destroy an android without batting an eye."

Vince shrugged. "Let's decide one thing first." He switched on a vision tape of the transmission from the *Sonia*. Once again the girl's face began to build up on the screen and she said: "I guess I should be flattered . . ."

The scorecard of probabilities, as far as Vince was concerned, came out about even. She was a golden blonde, and androids were more often blonde than humans. *Employers liked blondes*. But she was small, judging by what showed behind and around her, and androids were generally big. *They were made in order to work, and a big worker was better than a little worker*. She was very pretty, and no android had ever been a great beauty. On the other hand, her prettiness was the kind of chocolate-box perfection more like the work of a human artist than of nature. *Androids were never made ugly, but human women used their considerable influence to ensure that no android girl was ever TOO beautiful*.

"Now tell me," said Vince, as the picture disappeared, "is she human?"

"How would I know?"

"All right, I'll put it the other way. Is she android?"

There was a long pause. Vince was a little surprised. He had fully expected Sam to tell him to do something unlikely to himself. Evidently Sam was at least considering saying something else.

The differences between humans and androids, in appearance at any rate, were small but not non-existent. Vince could probably pick out a human pretending to be one of a group of androids, in the unlikely event of such a thing happening. And Sam was equally capable of picking out an android pretending to be human—if he chose to try . . .

"Okay," Sam said at last. "She's android."

Vince didn't ask him how he knew or if he was sure. Sam was watching him closely. Vince felt the hairs at the back of his neck rise. He was suddenly very clearly aware that if he did or said the wrong thing, Sam would fling himself at him.

But it was not because of that that he said quietly: "Right, we'll tell her to come in."

"Huh?"

"I'm not going to blow her up, Sam. Let her go on and she's liable to be executed on Quint IV. I'm going to call her in and keep her here while we try to get this thing straightened out."

Sam swallowed. "You're okay, Vince. Apart from being too starry-eyed. What's the use of keeping her here? The end result will be the same. She'll burn for murder. An android can't kill a human and get away with it."

"We'll see." Vince turned to the radio. "Observatory 6 calling *Sonia*."

Freda, Aram Space Control has been in touch with us. We know about Tom Purchase. You're instructed to land here at the observatory. Failure to do this will result in the destruction of your ship . . . but don't make us get tough. Going on is no good. Going back is no good. So please land here and don't give us any trouble. I promise that's your best chance."

He switched off.

"How can you promise anything, Vince?" Sam asked wryly. "How can anybody promise that girl anything, when there's one law for humans and another for androids?"

Vince didn't answer. "I'm going to hit the hay, Sam. Make sure she comes in. Get tough if necessary. Convince her that it's no good going on to Quint, now that both Aram and Quint Space Control know where she's headed."

"You're leaving that to me?" said Sam, surprised.

"Why not?"

"You trust me? In a case like this?"

"I trust everybody," Vince said. "That's my trouble. Wasn't that what you meant when you said I was too starry-eyed?"

SONIA ARRIVED at the observatory halfway through the next-but-one eight-hour period. Sam and Vince were consequently on duty together, and Vince was wide awake.

Freda came in through the landing-valve, needing no spacesuit. She was even smaller than Vince had guessed, five feet nothing in her high heels. And she walked into the observatory wearing a white dress and carrying a

white handbag. All she needed for a garden party was a hat and parasol.

She looked doubtfully from Vince to Sam and then back at Vince. She knew he was human, and Sam was android. Nobody would have made an ugly little runt like me, Vince thought.

The first thing she said did not accord with her garden party appearance. "Is this going to be any good?" she said quietly. "Wouldn't it have been kinder to blow up the yacht without warning me?"

Vince ignored the question. "Pleased to meet you in person, Freda. Allow me to remark that you have quite a person."

Freda, in turn, ignored this. "Why didn't you blow up the yacht, Vince? Sam told me what Aram Space Control's instructions were."

"I want to hear your story," Vince said. "Make yourself comfortable. Coffee? A soft drink? A beer?"

"You're testing me," she accused. "To make sure I'm android."

"I could be, but I'm not."

Certainly he could be.

Humans had a long tradition of social behavior, androids practically none. Less than a century ago androids had been grown as slaves and given only whatever training was essential to get the most work out of them. Even now, although androids were perforce recognized as the potential equals of humans, they were given only training and not education. It was too expensive to allow androids sixteen years or more to mature.

"The sofa is comfortable," Vince said. "Try it."

Freda sat down, arranging the skirt

of her dress carefully. She could only have had at most four or five years of conscious life, Vince reckoned. Probably therefore all her mannerisms were adopted from human models, principally actresses. It was not surprising that she made a performance of settling herself, showing too much leg and bosom, like a girl in a commercial about to be presented with a bumper box of candy.

Obviously now and beyond any lingering doubt Freda was an android, and a young one at that. Her uncertain, unreal, characterless radio replies were now explained, as were the various mistakes she had made—an android like Freda looked eighteen and physically *was* eighteen, but she had the experience of an adult not based on the groundwork of childhood. In any circumstances her radio messages would have been stilted. They were bound to be still more uneasy when she was trying to conceal the fact that she had killed a man.

She looked steadily at Vince. She had scarcely looked at Sam.

"You *know* I'm an android, don't you?" she said. "How?"

"Oh, many things. One quite important factor was that Sam said you were, and I think he would know."

She cast a glance of surprise and dislike at Sam.

"He had to know," Sam said defensively.

"Exactly," said Vince firmly. "I have to know. That's why you're here. Tell us what happened."

"How do you know I'll tell the truth?"

"I don't. But afterwards, maybe I

will."

TOM PURCHASE kidnapped her late at night outside the travel agency where she worked—she said. He scarcely knew her; it was while arranging the details of his flight to Quint that he met her and learned she was an android and that she could pilot a ship.

He was a once-handsome man suffering from a surfeit of wine, women and song, plus the excess of rich food that went with the wine.

There was little or no talk. He did not consider it necessary to explain himself. Since he weighed over two hundred pounds, not all of it fat, and Freda less than one hundred, there was no real need to show her a gun, but he did so just to make sure. As a further demonstration of the futility of resistance, he picked her up by the waistband of her skirt and held her with one arm five feet off the ground while she kicked and struggled. When she decided, although he had taken care to waylay her where there was nobody about, that screaming might be the answer, he dropped her and gave her a backhanded slap in the midriff which rendered her incapable of screaming for quite some time.

Still sick and dazed, she knew very little about the drive to the field. She only became fully conscious when she found herself in the yacht's luxurious lounge.

He was not interested in any views she might have about the situation. "You can talk all you want in space," he said. "And then I don't promise to

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listen. Meantime, drink this."

He had a small glass of clear liquid in his hand. She was on a couch where he had dropped her.

"If I don't?" she said.

"Then I'll slap you silly and pour it down your throat."

"What is it?"

"Never mind. Drink it or I'll hit you so hard you'll . . ."

He stopped, rather taken aback, because she took the glass meekly without further protest.

No doubt she should have let him hit her to make her surrender look better. But if he hit her again half as hard as he had done already—and he'd probably hit her twice as hard—she wouldn't have enough wit left to attempt the desperate chance she had seen and proposed to take.

"This is happening to me because I'm an android, of course?" she said, for no purpose except to divert the suspicion she saw forming in his eyes.

"I've been stood up, and I remembered you. So why not?"

"That figures, I guess. Especially that you were stood up."

He drew back his arm to hit her, but she had the glass in her hand and the contents would spill. "Cut the chatter," he said. "I have to go now. You'll do. You're the prettiest android I ever saw, and I can do things to an android no girl would stand for."

He slightly emphasized the word "girl" to make it clear that in his book she wasn't a girl, merely an android.

"Now drink that," he said, "or maybe I'll kill you and pick up a girl to take with me after all." Again he slightly emphasized the word "girl."

She was wearing a leather jacket, high around her throat, yet loose. And the far side of her face was in shadow. If she drank so much of the contents of the glass and let the rest pour over her face, down her throat and inside her jacket, perhaps he wouldn't notice. She'd have to drink at least half of the liquid, whatever it was.

No doubt it would still put her out. However, if she drank half the drug and he thought she'd had it all, she might come to sooner than he expected, or at least be less affected.

It was the only chance she could see.

She drank quickly. He watched and said nothing. She handed back the glass and shuddered at the taste, trying not to turn her head so much away from him that he would suspect what had happened, yet not toward him so that he would see that her face and neck were wet.

It worked. Within seconds she felt herself going rigid and knew the drug was a narcotic which induced paralysis without affecting the ears, eyes or brain.

She let herself go. It would have made very little difference if she had fought it.

"I don't need this any more now," Purchase said, putting down the gun on a shelf. "There are some things in the car I need. You'll keep till I'm through."

He propped up the gun where she could see it, where she had to stare at it unless she closed her eyes, the one physical action which was still within her control. "How's that?" he said. "Any time you want it, just pick it up . . . android."

The way he spat the last word at her told her what she could expect on the voyage.

Then he went out.

Freda tried desperately to move, but could move nothing but her eyelids and, with a considerable effort, her eyes. The sensation itself was not unpleasant, like lying in cotton wool. The lights seemed brighter than they had been.

She wasted half a minute wishing she had managed to swallow less of the drug. Mobile when Purchase thought her helpless, she could have made her escape somehow, or locked herself in the control-room. And the gun was only five yards away.

After a while she gave up wishing. If she had taken any less of the liquid, Purchase would have known what had happened. She was lucky to have managed to do what she did. The question was, had the full dose been far more than was necessary, or only just enough?

In five minutes he came back. "Just two more trips, honey, then we'll be off," he said, grinning down at her. "Frankly, this wasn't entirely on the spur of the moment. The first time I saw you I got this idea of taking you along with me to Quint. The girls are not as responsive as they used to be . . . I'd never admit that to any human being, but it doesn't matter what I tell you. Sure, I meant to take Stella. But it didn't break my heart when she didn't show . . . Well, I'd better get the rest of the stuff in."

Again he went out. And she found she could move the fingers of her right hand.

How long had he meant her to be paralyzed? An hour at least, to give him time to finish the loading, take off, leave the Aram atmosphere and set the yacht on course. But after that he'd want her fully recovered. She had seen he had no interest in her while she was frozen. He wanted to master her. That was his way. He wanted her to fight. He wanted her to be able to fight.

She could move her fingers. Now all she had to do was reach the gun. Five steps and she'd have it in her hand.

Five steps . . . and she couldn't even sit up. She drove herself almost insane with the intensity of her effort.

Ten, fifteen more minutes and he'd be through. Then the ship would take off. After that there was no chance he'd leave the gun with her, because he'd be expecting her to recover at any moment.

Every minute she could move her arm and fingers more freely. She could also move her toes. But her back might as well have been broken. She could not even lift her head.

When Purchase came back she was very nearly as helpless as he believed her. Her one remaining hope was that he would leave her again—and the gun—while he got the ship off the ground. In another twenty minutes, she was sure, she would be able to stand.

"All set," he said. "I've set the automatic pilot. Blastoff any second now."

So he was not going to leave her again. She had lost her chance. She had never had a chance. He looked at her, and she was afraid.

Ten seconds later she heard the jets

roar. Although there was no sensation of movement, because she could feel nothing, she knew the ship was off the ground.

Purchase caught the direction of her intense gaze and laughed.

He picked up the gun. "I don't need this any more," he said, "and I'm not going to be fool enough to leave it lying around. It goes into space the moment we're clear of the atmosphere."

He laughed again and suddenly threw the gun. It landed heavily on her stomach and even in her doped state, although there was feeling only in her fingers, she had a stab of pain and nausea.

She didn't think. She clawed up the gun and shot him dead.

"I HAD TO," she told Vince and Sam pleadingly. "If I'd only wounded him, he'd have torn me to pieces in his rage."

There was a brief pause.

"I could scarcely move," Freda said. "It wasn't as if I could have knocked him out for a moment and run away while he was out. Killing him was my only chance. If I hadn't killed him, he—"

"Nobody's arguing," said Vince. "I guess no court would argue either. If you told your story and requested a lie-detector check—"

Sam laughed harshly. Less harshly, but also sceptically, Freda joined in.

"Do you think an android would be allowed to get away with killing a human, whatever the circumstances?" Sam inquired. "And in this case the

circumstances are that a rich and influential actor is gunning for Freda. He wants her dead."

"But if Freda's story is proved true, I don't see—"

"That's just it," said Freda gently. "You don't see. No human can know just what it's like to be an android, Vince. Do you think for one moment that even a man like Purchase would have dared to try anything like that with a human girl?"

"Why, in heaven's name," Vince said irritably, "did you tip the body out right away? If you'd waited until the yacht was in deep space, there wouldn't have been one chance in ten million of the body ever being recovered."

"I know. I was a fool. But when I realized he was dead it was so horrible knowing I was alone with a corpse that I hauled him to the airlock the moment I was able to move."

Vince shrugged. "I guess nobody should blame you for not being a good killer. Listen, both of you. We're all going back to Aram. We're not going to let you out of our sight, Freda. We're going to be at your trial and we're going to see that it's a fair trial."

Freda looked at him almost pityingly. "Vince, I guess you're sincere, but you live in an ivory tower. All through human history, thousands of years before androids existed, the race in power only had to have the shadow of an excuse not only to persecute any other race, but actually feel justified. Blacks, Jews, Chinks, Wops, Wogs, Abos—all that was necessary as an excuse for persecution and murder was the possibility of

classing a minority group under a derogatory name"

"Androids have no souls," Sam said bitterly. "Androids can be owned as no slave was ever owned. Androids are nothing."

"Another thing," Freda said. "Even if my story was accepted, I'd never get away with a self-defense plea. Purchase never threatened to kill me. He wanted me alive, not dead. Think a human court would ever grant that an android had a right to kill a human merely to avoid . . . being treated like an android?"

This time Vince had nothing to say. He had missed the importance of this technicality. Even an android might be granted the right to kill rather than be killed. But it was unlikely that abduction and assault would be considered strong enough justification—for an android.

Breaking a long silence, Freda said: "Shall I make some coffee and give you two a chance to consider what to do with me?"

"There's only one thing to do," Sam said. "Get back on your ship, set a course for the most distant colonized world and put yourself in deepsleep. You may waken. You may be able to land. You may be able to take a different name and live out your life without the law ever catching up with you."

"I'll make the coffee," Vince said. "I want to think."

"Sure," said Sam. "You're the only human here. You make the decisions. Nothing we say or think or decide can possibly count. Freda and I are only androids."

Vince looked long and thoughtfully at Freda. She was even more beautiful than he had thought. He had never seen an android as beautiful, and few human girls. What Purchase had tried to do was not in the least difficult to understand

He went to make the coffee.

SAM OPENED his eyes and found he could do nothing else. From what he could see, and not from anything he could feel, he knew he was lying on his bed.

He had a moment of panic, but it passed at once. Freda had told them of the drug Purchase had used on her. There must have been some left on the ship.

He was not angry; in a way he was relieved. If Freda had drugged Vince as well as himself, the problem of what to do with the girl was solved. She was already gone, and no action would be taken against Sam, not with Vince involved. Two androids who let an accused person get away would be in trouble. But an android and a human—that was different.

Sam's view of the situation took a tumble when the door of his room opened and Vince came in.

Vince was carrying a portable recorder, which he plugged in and started before speaking.

"Sorry about this, Sam," he said easily, "but I guess you'll see it's the only way to save Freda. You and I know she's innocent, that she killed only in self-defense, but we'd never get a court to acquit her. So I'm going with her, Sam. I can't tell you where,

obviously.

"Frankly, I don't think the law will look too hard for us. If it was you, now—that wouldn't do. If you, an android, ran off with another android accused of murder, you'd be hunted down, even after years of deepsleep and on worlds umpteen lightyears from here. Me—well, that's not the same thing. I believe in Freda's innocence and I'd fight to prove it. And I'm human. The law won't be particularly keen on having all this thrashed out in court years from now, including the fact that a human observatory officer was so concerned about the injustice involved that he ran away with an android.

"You're covered, of course. You're drugged so heavily it will be hours before you can move. And naturally I've put the missiles out of action so that you can't destroy the yacht. This recording is all you'll need to establish that you had no part in what happened."

He paused and then added: "Incidentally, this was my idea. Freda had nothing to do with it until after you were drugged. Remember I was a long time getting the coffee? I went to her ship. I thought there would be some of that drug left, and there was. I gave you such a massive dose that you flaked out completely . . ."

Sam wanted to ask about Freda. What had she done when she realized what Vince intended? How did she feel about it now?

He was never to know. Vince switched off the recorder and ran a little of the tape back to make sure his voice had recorded clearly. Then he

said: "So long, Sam. It's been nice knowing you," and went out.

Vince was a pretty good guy, Sam thought. He was giving up a lot and taking a fair number of chances to help a girl—an android—who could not mean much to him. Sam didn't believe in love at first sight and he didn't think Vince did either. And Vince had not even pretended that he was doing this because he had fallen in love with Freda.

True, she was a very pretty girl, intelligent and capable. Well . . . of course Purchase had been right. She wasn't a *girl*. Anyway, she wasn't a *woman*. No female android could ever have a child. And no male android could beget one. In the privacy of his own mind, whatever he might say, Sam accepted that androids, human in every respect save that they could not reproduce, were just androids.

Vince didn't stand to gain much, any way you looked at it. His decision could only have been reached in a spirit of altruism which Sam frankly admitted was beyond him.

Sam would always wonder what became of those two, but he would never know, unless they failed to get away with it.

He was right: Sam never saw Vince or Freda again, and he never knew . . .

X

ON THE *Sonia*, all went well until they had done all the routine jobs and were tired and with the yacht on automatic it was time to turn in and there was no reason why either should stay on watch.

They intended going into deepsleep, but not for some days. Calculations and observations had to be very exact before a ship could be trusted to deliver them safely, unsupervised, some three hundred light-years away.

It was Vince who was nervous, uncertain, and Freda who was calm and confident.

"Freda," he said suddenly, "we'll be married if you want it."

She shrugged. "It doesn't matter. A human never has to marry an android."

"But I want to—"

She smiled, but gently, sympathetically. "What you want is to make it right that we should share a cabin."

"I'll wait if you like. Until after the deepsleep. Until we—"

"You don't have to wait." She came to him and inserted herself in his arms. She was so tiny that he topped her by nearly a head.

"Listen, Vince," she said. "It's a fine thing you're doing—"

He moved uncomfortably. "Don't say that."

"You think I don't know that you're painfully shy?" she said. "That you get on well with androids because we always look up to you, thinking *He's human and we're not* . . . Vince, I know you. And it's a fine thing you're doing."

"Mostly selfish," he muttered, not looking at her, although she was passive in his arms. "I never made the grade with girls. I'm an ugly little runt, and I know it. Any time I ever began to think 'This is it,' I found out sooner or later that the girl was two-timing

me—"

"Lots of men find that. Including the ones that look like Greek gods."

He clutched her tightly, then slackened his grasp. "Freda, what's bothering me is—would I have done this for you if you'd been a man instead of a beautiful girl?"

"You would."

"I wonder. I'll always wonder."

"You might not have done the same thing, perhaps. That's an academic point. It's natural a man should run away with a girl, not natural he should run away with another man. But you wouldn't have blasted the ship."

"No," he said, his confidence and manhood beginning to return. "No, I guess I wouldn't."

"So forget it, Vince."

He was more himself, but still hesitant. "You came with me because you'd no choice. It wasn't so very different from going with Purchase."

"It was so different," she said quietly, "that there isn't really any resemblance."

"You can't . . . love me."

"Not yet. But there's something else, Vince. Something even more important and lasting. I've got far less experience of life than a human girl, but I know all about it."

"Tell me."

"It's corny. It's straight out of romances in women's magazines. But that doesn't make it any less important or real."

He kissed her, gently and cautiously, still unsure. Yet she was startled: he was, after all, a man, a man with a great deal of experience. Androids had kissed her. A few humans like Purchase

(CONTINUED ON PAGE 129)

Howard L. Myers ("Questor," "Psychivore") returns with a scientific answer to an age-old philosophical proglem: if men have souls, how are they supplied, and what happens when they run out—?

SOUL AFFRIGHTED

HOWARD L. MEYERS

Illustrated by MICHAEL KALUTA

DELLBAR SLOWED as he approached his driveway, giving himself a moment to send out his usual earnest but randomly aimed prayer.

Please, make her be here this time. Make her be home. Let me see her car when I turn in.

He swung into the drive, and could see into both sides of the garage. Her car wasn't there.

He hadn't really expected it to be. But every evening he managed to hope until he could see into the garage.

He parked and went around to the front of the house to pick up the newspaper and mail, then unlocked the door and went inside. A quick glance around, into the bedroom, bathroom, and kitchen, told him Margitte hadn't been in all day. And she hadn't been there last night, or for much of the previous day.

Dellbar dropped tiredly to the couch, and sat slumped forward. His depression was a numb ache he had learned to tolerate during his two years of marriage, but he had a feeling it was wearing him down. It stayed with him now even when he was at work, and

that was bad for the job. The other guys at the lab were beginning to wonder about him. The department supervisor had asked him a couple of days ago if he felt okay.

Where was she this time? Tripping out on acid? Or had she gone on to the really hard stuff? Or maybe it was booze and sex—although she had sworn she saved all her sex for him, but he couldn't quite believe that. How could she put that one restriction on herself, and no other?

He found himself staring at his dim reflection on the dusty face of the television screen.

"You're the world's most mismated man," he told himself aloud.

Then why don't you unmate? he replied silently.

"That's why I say the most mismated. It wouldn't be that bad if I could break it off."

You're stubborn, or stupid, or a sucker for punishment.

"All three. Also, I still love her, but maybe that's covered by 'stupid'."

It is.

Dellbar stood up, annoyed. These

solo dialogues didn't accomplish anything.

A drink? No. If he had a drink he would mope around all evening, feeling worse and worse. The only thing that would distract him, even a little, was work. So . . . get some supper, and then to the workshop.

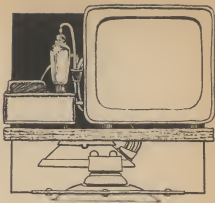
Something had spoiled in one of the kitchen bins, making a stink that killed what little appetite he had. He hunted around till he found what it was—a large paper bag containing one very rotten onion. He carried it out to the garbage can. Then he gulped down a cheese sandwich and a glass of milk.

The sandwich felt heavy in his stomach as he went down the basement steps and into his workshop. For several minutes he perched motionless on the stool at his bench, gazing at the visualizer he had built while he tried to put thoughts of everything else out of his mind.

That was hard to do. There was too much relating the visualizer and Margitte. He had built it for her, although she didn't know that. And it, like his marriage, was a failure.

What was wrong with it? Was his idea that such a device could be made fallacious? Or was it something less basic? Maybe nothing more than a failure of one of the junk electronic components he used in building it? Or perhaps an overlooked imbalance in the circuitry?

Intellectually, the visualizer was a strangely conceived device—half of it straight electronic engineering, and the other half modern-day witchcraft. Dellbar had, at first, been surprised after getting his degree and taking a job to learn of the "dark



technology"—the weird and unexplainable effects that could be produced by such-and-such arrangements of electronic gear. None of this was to be found in textbooks; it passed by word of mouth when engineers got together over a few drinks. It was the folklore of electronics technicians, unsupported by scientific theory, unannounced to the public, and spoken of among the engineers themselves in low voices, and seldom then until their tongues were loosened by drug or drink.

Dellbar had listened, and disbelieved. Then after his wife had begun staying out and he needed business for lonely hands, he set up his basement workshop and tested the dark technology for himself. After that, he believed.

But so far, the visualizer had not worked.

Could he, himself, be the faulty component? He grimaced. The visualizer was supposed to reveal, on its second-hand color-TV screen, whatever the user wanted to see—not necessarily his favorite TV show, but *anything*. That meant the user was, in truth, part of the visualizer circuit, the tuner, the channel selector.

But that meant he had to *want* to see something. And the mood he had been in recently left him with very little desire to look at anything.

Not that he didn't see the world around him; it was there, and he had no choice but to be aware of it. But to actually *will* to see something more than that, something he didn't have to see . . .

He braced himself and turned on the visualizer. The place to attack this

problem was at its root. He was afraid of the sight—and knowledge—of what Margitte was doing, what had stolen her away from him. Okay, what he had to do was face up to that sight squarely, painful though he knew it would be. Know and see the worst, and then he could look at other things without fear.

I want to see Margitte.

His heart thudded as he built this decision in his mind, and his eyes stared at the blank screen.

But it was no longer blank. The image was foggy but her face was vividly clear.

A hard shiver ran the length of his spine, and his hair stirred. His concentration skittered away and the screen was blank again.

All he had seen, he realized, was the expression on her face. It was a look he had never seen her wear, not even when they were in bed together. To see that was plenty, without seeing the cause of it. He heaved a quaking sigh and turned off the visualizer.

At any rate, he knew the device worked. Maybe it would give Margitte the sensual stimulation she seemed to live for while keeping her at home. Anything, real or imagined, that she wanted to see, without the bad-trip risk that went with acid of things she didn't want to see.

The visualizer ought to work well for her, with her sensual hunger, though it hardly worked at all for him because . . . well, because he was too scared to look. The feeling he experienced when his concentration on her image shattered made that obvious.

Still, there should be something he wanted to see, that wouldn't frighten

him. Something intellectual instead of emotional. Something impersonal.

Reality! That was it. Not the routine reality of daily life, of biology, of electronic theory, of the physical laws of the universe, but the *underlying* reality—the realm of basic cause, of which all things man knew were merely effects. The reality philosophers sought after . . .

That he could look at, if it was there to see. He could face reality.

He turned the visualizer on once more, and concentrated. The screen went jet black, then some formless thing swirled on it, nearly breaking Dellbar's concentration again, but he hung on grimly. The swirl steadied and shaped itself into a man's face.

And the man was looking at Dellbar. He was aware of him.

"Well!" the man chuckled with amusement. "One of you has penetrated! Very clever!"

"Yes." That grunt was all the response Dellbar could make without breaking his concentration.

"Oh, relax!" said the man. "I'll maintain the connection for you."

Dellbar did so, feeling caved in. The image stayed solid.

The man asked, "In what form do you see me?"

"As a man. An older man, with white hair. Clean shaven."

"That's appropriate enough, I suppose. Were you looking for God?"

"I—I don't know. Maybe I was," Dellbar mumbled. Then he pulled his mind together and said, "I was looking for the underlying reality."

"Aha! Why?"

Dellbar hesitated. "Because . . . I want to understand."

"I see. You think you can face understanding?"

"I don't know. I'm willing to try. I need to know there's something more than . . . well, I need to know if there's a purpose."

The image on the screen studied him with a slight smile. "There is a purpose, all right, but you flatter yourself if you think you can understand it. The closest you can come is to regard your reality as a combination kindergarten, campground, and insane asylum. It has features of each of these."

Dellbar tried to find the significance of that. "Then it is in preparation for something else," he guessed.

"Of course! How would you define 'purpose' other than as intention to prepare? But you want to know more than generalities. Here. Look at this and tell me what you see."

The image changed. Dellbar squinted his eyes.

"Boxes," he said. "Millions of boxes, stacked high, in rows. They look empty."

"They *are* empty. Every one of them. So you see them as boxes. That's close enough. They are storage bins for what you think of as souls."

"Oh." So souls were real. "Why are they all empty?" Dellbar asked.

"Why do you think?" the voice chuckled. "Consider conditions in your world today."

Dellbar did so, then hazarded, "The population explosion?"

"Obviously! The demand for souls* has far exceeded the supply."

"But . . . but how can that be?" Dellbar protested. "How could there be more people than souls?"

"Very simple. Billions of people don't have souls. It is an unusual situation, of course, but no reason for that alarmed expression you're wearing. Such conditions are self-correcting."

"But that means a lot of people aren't *human*!"

The boxes vanished and the face reappeared to say, "You could put it that way. Or you might say with more accuracy, a lot of people are not *more* than human."

"They're not zombies?"

"By no means. The unsouled are distinguishable from the souled by their lack of high purpose. Take yourself, for example. You wouldn't have been interested enough to ask about underlying purpose if you had no soul. And you wouldn't have dared ask the question unless you were unconsciously certain a purpose really existed. Right?"

Dellbar nodded.

"Thus, you have a soul. Now, you tell me, how would an unsouled person think and act, in contrast to yourself."

"I suppose . . . without . . . without whatever purpose a soul has. Whatever a soul is supposed to do . . ."

"The kindergarten, campground, insane asylum program," approved the image. "Correct. The unsouled person would find random motivation for activities—mostly based on exaggerations of the normal needs of the physical body. The acquiring of more territory or mates than can be used, the consuming of more food than the body can handle, the search for sensual pleasure . . . all these are symptomatic of the unsouled."

"But there were people like that before the population explosion," Dellbar objected.

"Yes. For various reasons, not all bodies are suited as habitats for souls. But normally the unsouled persons are a small minority of the population. If present growth trends continue, they will become a majority. But as I told you, the condition is self-correcting."

"How so?"

The image shrugged. "Who do you think is more likely to start a war, or to pollute your environment . . . the souled or the unsouled man?"

"I guess the unsouled."

"So, there you have it. A self-correcting condition."

Dellbar remarked sharply, "You don't seem to care if we have a war. Are you so indifferent to human suffering?"

The image laughed at him. "You're mistaking me for one of your legendary merciful gods. I'm really just an administrator. And the general happiness or unhappiness of humanity is neither here nor there, so far as basic purpose is concerned."

"And you don't give a damn," grated Dellbar, "that I'm married to an unsouled woman—a sensual pleasure-seeker—and she keeps me in continual torment."

"Not the slightest damn," the image smiled. "However, that will change now, as a result of this conversation. Your soul is ready to move on. This doesn't mean death, so don't turn so pale. You will merely complete your existence as an unsouled person."

"You mean I'm ready to . . . to graduate from this reality?" asked

(CONTINUED ON PAGE 126)

THE VOLUNTEER

In Allen Rivers' first professionally published short story, the focus is sharp and immediate: overpopulation is killing us.

ALLEN RIVERS

ALICE HEARD his cries through the thin walls of the class four unit. Then, through the open window, she saw her son Billy racing along the narrow dirt road of the squatter compound, towards the shack. His nose was spurting dots of blood.

Alice's husband rose slowly from the bench he'd been straddling. "Is that Billy out there?"

"Yes, he's been in a fight again," she said, rushing out.

Alice lifted her son under the arms and, keeping him at arms' length, half carried and half dragged the screaming boy into the shack. She set him down gently on the floor and murmured to him till he sat quietly, then she tilted his head back and removed the blood-spattered shirt. She placed the shirt in a plastic bowl and filled the bowl with cold water. The water turned a pale pink as she dipped the shirt.

"I hope the stains come out," she said, concern creasing her freckled brow. "We have only enough soap to last a week and another ration isn't due for two weeks."

Suddenly Alice threw the shirt violently into the bowl, splashing water over the floor and her dress front. Still

angry, she turned to her son who sat sullenly on the floor where she had left him.

"You've got to stop fighting," she shouted. "We can't help what we are. Fighting and ruining your clothes won't help a bit. Were you fighting with Tommy again?"

The boy shrugged and stared at the floor.

"Answer me!" she screamed.

Billy dragged himself up and shuffled over to the screened partition that contained the children's bunks. He paused a moment, then turned and glared at his mother.

"Tommy was eating confection in front of me," he blurted, his small face twisted with hurt and envy. He turned the glare to his father. "Since Tommy's pop volunteered for Human Betterment," he said pointedly, "they have everything. They're moving out of stinking class four!"

He disappeared behind the screen. Alice darted after him. She stopped short at the screen. "Don't you wake Suzy," she hissed.

Joe came over to her and patted her shoulder. "Not Billy's fault," he mumbled. "He's only a kid. He don't

understand."

"Of course it's not his fault," Alice snapped, jerking her shoulder away from him. She went back to the sink and worked on the shirt. She squeezed the water out of it, shook it gently and inspected the front. The spots were faintly visible.

"The soap wouldn't help anyhow; it's the lowest grade." She frowned at her red, chapped hands as she hung the shirt on a line strung across the narrow room.

"It eats away the skin," she said, "but it doesn't clean anything."

She wiped her hands along her dress front and looked blankly at her husband. "It'll never get any better, Joe. We'll always be class four, the damned lowest there is."

Joe reached out with his big hands, then let them drop awkwardly to his sides. "Something will turn up, hon. Maybe they'll issue me some books, or I can apply for a special course to catch up, or—"

"You failed the aptitude test," she said coldly, "and your I.Q. wasn't exactly genius level. Stop dreaming, Joe, you'll never be more than a lackey for the maintenance crew."

"Well maybe we'll get a chance to move somewhere else."

"Move where? Joe, we have no family anywhere to give us their place. Class four is forbidden travel. How do we find something else? You tell me." She waited, then threw up her hands. "Joe, face it, this lousy little cell is it."

Joe slumped back onto the bench. "You want me to volunteer for Human Betterment?"

Alice ignored the question. She wiped the blood spots from the floor,

then wiped up the water she had spilled.

"Well?" Joe said.

Alice rinsed the wash-rag and draped it over the faucet. "What's the good of our being together if we get to hate each other?"

She looked over and saw Joe staring down at the big clumsy hands that doomed them to a class four existence.

Alice ran to him. She took his face between her hands and kissed it gently. "Let's not talk about it any more tonight, Joe."

"All right, hon." Joe held her tight, his head pressed against her breast.

Alice walked over to the single window of the unit, dragging one of the narrow benches behind her. She almost stumbled over Billy and Suzy doing somersaults on the floor. Frowning at the children, she kicked the bench in place under the window and dropped onto it. Her dress, soaked with sweat, felt clammy against her body. She pulled the bodice away from her skin and fanned herself with her hand. It was only temporary relief and she gave it up.

"Billy," she called listlessly, "take Suzy outside and wait for Daddy. All of us cooped up in here just makes me feel hotter."

"Tommy's new place will have a fan," Billy said, taking his sister by the hand.

"Out," Alice said threateningly.

"We're going." Billy slammed the door behind them.

Alice gazed wearily out the window. The sky was heavily overcast and the air almost too heavy to breathe. Gray squatter units blended into the gray of

the class three high rise buildings which loomed above the compound. The red, white and blue of the posters plastered on the government ration house stood out against the grayness. Alice stared at the picture of the man with the long white beard and long pointing finger. Although she couldn't make out the words below, she knew them by heart.

"YOUR COUNTRY NEEDS YOU—VOLUNTEER!"

Alice began to doze fitfully, rivulets of sweat ran down the side of her face.

"You're gonna wear a dent in that window ledge."

Alice came to with a start. "What?" She looked up at Joe's grinning face, the supper ration tucked under his arm. "Aren't we smart. At least you're allowed to work." Alice pulled herself up reluctantly; her dress clung to her damp legs.

"Mom, Mom, guess what Pop did?" Billy and Suzy danced around Joe.

Alice scowled at them. "I'm in no mood for games," she said. "It's too hot." She peeled the dress away from her legs, leaned over and used the skirt to wipe the sweat from her face.

"Mom, we're trying to tell you . . . Pop volunteered!"

"Oh, Joe." Alice threw her arms around him. "Joe, I was just cross the other day. We'll make out."

"Ah, hon." He caressed her awkwardly. "I want to do it. Come on." He patted her bottom. "You got a dinner to cook. I got us a piece of real meat and a bottle of beer."

Alice numbly accepted the bag of rations then slowly padded over to the hot plate atop the sink cabinet.

The meat was done in minutes and

Alice placed it ceremoniously before Joe. Joe picked up the knife and clumsily hacked away at the meat.

"Let me do it, Joe." Alice laughed to cover her impatience. "You get waited on tonight."

Alice doled out the meat giving the largest portion to Joe. They ate silently, savoring each bite. Suzy sucked her piece with contented gurgles, the red juice dribbling down her chin.

The small bottle of beer was opened and served with equal ceremony. The children climbed onto Joe's lap and each was given a taste of the beer. The family sat around the table till dusk quietly talking and sipping.

Presently, Joe put the sleeping children in their bunks while Alice cleared the table. The dishes done, Alice pulled out the long drawer under their cot and removed Joe's clothes.

"Don't bother with that tonight," Joe said. "I can turn them in before I go in the morning."

"I'd rather be doing something," Alice insisted.

Joe pulled her up to him. "This is our last night," he whispered hoarsely.

"I can't help it, Joe. I'm scared."

"Come on, hon." He kissed her hungrily then pulled her down to the cot.

Alice, her elbow propped up on the window ledge, stared vacantly out at the compound. She thought about the new life ahead. Class three was a big step up from the subsistence level of class four. She would have credits to spend and she could make her own choices. The children would have toys and books and clothes. But it had been a week since Joe volunteered and no

(CONTINUED ON PAGE 110)

Will Carewe was the first man to try the new E.80—a biostatic drug which would not only guarantee him physical immortality, but continued male virility as well. So why was someone so determined to kill him?

ONE MILLION TOMORROWS

BOB SHAW

Illustrated by MICHAEL HINGE
(Second of Two Parts)

SYNOPSIS

The year is 2176, and for roughly two hundred years mankind has had immortality within his grasp—providing he is willing to pay the price.

The price is sterility and the loss of the male function among all men who allow themselves to be injected with the biostatic drug which grants them practical immortality. Women are not similarly affected—indeed, a woman who has turned immortal can always be identified by the glow of health which she radiates.

Society has redefined itself to accept these changes. Males still mortal are known as "funkies," while those who have "tied off" and become immortal are "cools." The most common badge of the "cool" is his beardless state;

beards (or the stubble of beards) are worn as proud symbols of their virility by the "funkies." Since immortality locks one into the period of one's life which one is in when the biostatic drugs are administered, a young man is given an uneasy choice: to balance the years of his mortality and sexual performance against the possibility of "tying off" after his body has begun to age and deteriorate.

This choice is facing young (forties) Will Carewe. An accountant with Farma Incorporated, Will is married to Athene, in a one-to-one marriage. Both are nearing the point at which they should take their shots and become immortal, but Will is hesitant. Athene won't take her shot unless he also takes his—she refuses to watch him grow older while she remains in ageless immortality—and he is afraid of what

the loss of his male function would do to their marriage. They've been married ten years, and it's included a number of ups and downs, but he treasures it.

Hy Barenboim, Farma's president, offers Will the way out: become the first man to try new E.80, an immortality drug which does not render the male impotent. Will leaps at the chance, but when he tries to tell Athene about it that evening, she does not believe him. She considers it simply the latest of his tricks to get her to take the drug while he does not. This adds a new strain to their marriage, and drives a wedge into their already fragile link of communication.

Nonetheless, Will takes the injector of E.80 with him on their tenth-anniversary honeymoon to Lake Orkney, and there he and Athene inject each other with the two injectors supplied by Farma. To Athene the injectors appear normal, and contain E.12, Farma's standard biostatic. Only Will knows that his contains E.80.

Will uses a depilatory to disguise himself as an ordinary "cool," but never has a chance—or feels he has—to tell Athene that he is still functional beyond the normal three-day period after "tying off". Because when they return home, he finds Athene has made an inexplicable turn away from him. She treats him coolly and distantly, and informs him she is pregnant. Because Will knows he was not fertile—having taken his monthly contraceptive pill weeks earlier—he is shocked, and additionally repelled when she refuses to tell him the name of the father.

Dazed, disgusted, hurt, Will tells



Barenboim he wants to join a Fauve squad in Africa. These squads are devoted to subduing African tribesmen who "break out" on murder rampages—they are forcibly "tied off" and in effect castrated. The work of a Fauve squad is dangerous, since the Fauves can put up a full-pitched resistance to the squad, but the squad men can attack only with their biostatic injectors.

Will's decision is not rational, but Barenboim assents to it and agrees to transfer him to a Farma division servicing the Fauve squads.

It isn't much like what he had expected. Weather control is used to funnel continuous rainstorms into the area where the Fauves have their villages. A few weeks of continuous rain will subdue the most savage breast.

Will is met by Felix Parma, a paunchy little man who is well past tying off age and still functional. Parma is an inveterate beer drinker, and introduces Will to the local pleasures, such as they are. When he finally staggers to his room he finds it in darkness, and gropes his way across the room to the environmental control panel, finds the master switch, and throws it. When the lights come on, he sees that the control panel's cover is not in place. It is only by sheer luck that his blind fingers hadn't touched a high-voltage terminal.

This is not to be the last apparent attempt on his life. Taking out a floater the next day to join the actual Fauve squad to which he has been assigned, he is crossing a river when the floater suddenly goes dead, immediately

sinking to the river's bottom. Only Carewe's feverish ingenuity allows him to escape that trap.

Finally he joins the squad and participates in its first raid. What he sees sickens him, and full of remorse for what he has helped to do, he goes to one of the huts of his victims.

"I'm sorry," Carewe said inadequately. He was turning to rejoin the Unations team when the woman emerged from the hut in a blur of frightening speed. She closed with him, her hand glinting with steel, then backed away. Carewe stared into her triumphant face for a long moment before looking down at the knife protruding from his chest.

He was kneeling in the mud, still shaking his head in disbelief, when the Unations team came back for him.

CHAPTER NINE

IT WAS A very old knife," Dewey Storch commented. "That's what saved you."

Carewe stared soberly at the ceiling of the trailer in which he was lying. "How am I?"

"You'll survive. The blade had been honed down till it was more like a thin spike—not the most efficient of weapons."

"I'm not complaining." Feeling no pain, Carewe tried to sit up in the narrow bed.

"Take it easy," Storch said, firmly pushing him down. "Your right lung got punctured, and the medic has

collapsed it."

"*Collapsed* it! Does that mean . . .?"

"It's a temporary thing. Gives the lung a rest, that's all." Storch looked over his shoulder at someone beyond Carewe's field of vision. "Isn't that right, Doc?"

"Absolutely," a man's voice said. "There's no need for alarm, Mr. Carewe. Your lung bled internally for a while, but we've put a stop to that and drained off the blood. All that's necessary now is to give the lung a rest."

"I see." Carewe felt ill at the thought of one of his lungs lying limply inside his chest. He turned his senses inwards as he breathed and realized, for the first time in his life, that the process of taking in air began not with the lungs but with the muscles of his rib cage. The ribs rose, expanding the organic bags attached to them and causing vacuum-seeking air to rush in through the nose and mouth—except that in his case only one lung was operational. Half-expecting to feel starved for air, he concentrated on breathing steadily while he was carried out of the trailer on a stretcher and put in an ambulance.

Back at the base, he was carried into a medium-sized dome which served as a medical center. There were three other beds in the single ward, but they were unoccupied, and the afternoon air was filled with a buzzing peacefulness. A female nurse visited him every thirty minutes, and a medic called Dr. Redding looked in twice to see how Carewe was and told him he would be shipped out the following day. Both

treated him with a kindly efficiency, which served only to make him feel depressed and inadequate. Fauve teams throughout the world were notoriously short of help and rarely turned away an able-bodied volunteer, but all along he had felt that the old hands regarded themselves as a cadre of professionals who occasionally had to humour well-meaning amateurs. The Beau Geste syndrome, Kendy had called it. Carewe had no idea who Beau Geste was, but he had a feeling the morning's exploit would cause some hilarity in the Unations club's huge circular bar when night came. He allowed himself to drift off to sleep, hoping he would dream of Athene and the warm secure past . . .

In the evening, when white moths were thudding at the windows, he had a succession of visitors which included Kendy, Storch, Parma and some faces dimly remembered from his beer-sodden induction. Parma was the only one who expressed what appeared to be genuine regret at Carewe's scheduled departure, his silver-stubbed face solemn as he offered to smuggle in some beer from the club for a farewell celebration. Carewe refused gratefully, and when the old funkier had gone asked the nurse for a sedative. He swallowed the banded capsule and stared stoically at the ceiling, waiting for it to take effect.

Much later he awoke with a conviction that something was wrong. He glanced at his wrist and stared for a moment at the blank skin before remembering that the Nouvelle Anvers region was too far from a grid transmitter for his watch to work. A

footstep sounded beside the bed. A swarthy young man in medical whites was holding out a glass of water and a pale blue pill.

"Sorry to disturb you, Mr. Carewe," the stranger said in a low voice. "It's time for your GP booster."

"What's it for?" Carewe demanded drowsily.

"Dr. Redding doesn't take any chances with wounds—it isn't considered healthy in this part of the world."

"Well, I suppose I . . ." Carewe raised himself on one elbow and took the glass of water. He accepted the pill without further comment and was raising it to his mouth when he noticed that the stranger's fingernails were rimmed with dirt. He brought his eyes to a bleary focus in the wan light and saw the network of ingrained grime on the back of the man's hand.

"Just a minute," he said, struggling to shake off the effects of the sedative, "are you sure Dr. Redding wants me to take this?"

"Positive."

"Supposing I refuse?"

"Listen, Mr. Carewe," the words carried an undertone of urgency, "do us both a favour—just take your medication, huh?"

"I'll take it after I've seen Dr. Redding," Carewe tried to study the stranger's face but his head and shoulders were above the cone of light from the bedside lamp.

"All right, Mr. Carewe—I don't want to fight with you."

The man held out his hand and Carewe dropped the pill into the palm. An instant later he was smashed

downwards under the weight of the white-clad body and a powerful hand was pressed over his mouth. The pill clicked and ground against his teeth. Filled with an icy certainty that if the pill got onto his tongue his life would be ended, Carewe tried to throw the attacker off, but his knees were trapped in the bedding. The hard hand clamped his nostrils, depriving him of air, which meant he could hold out for only a matter of seconds. As his vision reddened, Carewe became aware of a smooth object in his left hand—the glass of water. Holding it by the base he thrust upwards at the dimly seen face. Water cascaded down his arm as the glass shattered, and suddenly he could breathe again. The stranger scrambled away, moaning, holding his lacerated cheek together with one hand and producing a knife with the other. Carewe frantically threw the bedclothes off and rolled out of bed on the opposite side, hit the floor and kept on going in the direction of the doorway, with pursuing footfalls close behind. Something was slapping around inside his chest like a piece of wet leather. One part of his mind made the sickening discovery that it was the collapsed lung, but the main focus of attention was on escaping before he got a knife thrust in his back. He exploded through the swing door, saw another leading to the general office and shouldered it out of his way. The office was empty. He snatched a black wooden carving from the top of a desk and turned to defend himself but the stranger had vanished. The only sound was the unsynchronised slapping of the swing doors. He ventured out into the

entrance hall just as a white-clad figure appeared in the black rectangle of the outer door. Carewe raised his improvised club, but the newcomer was the female nurse who had attended him earlier.

"You shouldn't be out of bed, Mr. Carewe," she said, eyeing the carving suspiciously. "What's going on here?"

"Somebody tried to murder me," he said hopelessly.

"You've had a nightmare—now go back to bed."

"I was wide awake at the time." He handed her the carving. "Didn't you see anybody run out of the building a minute ago? Why weren't you here anyway?"

"I saw nobody running from the building—and if you must know I was out because I got a call to say there'd been an accident in the communications room."

"And had there been?"

"No."

"That proves it then." Carewe was triumphant.

"Proves what?"

"That somebody lured you out of the way so they could get at me."

"Mr. Carewe," the nurse said tiredly, pushing him towards the ward, "all that proves is that Felix Parma or some of the others got stoned tonight again. They're probably staggering around in the dark out there thinking up ways to make nuisances of themselves. Now will you please go back to bed?"

"All right." Carewe got another idea. "Have a look at this." He led the way to his disheveled bed and searched around it. The blue pill was gone and

the broken glass lying on the floor showed no trace of blood. He examined his left sleeve and found a single spot of redness bleached into near-invisibility by the water which had poured down his arm.

"There's a spot of blood," he said significantly.

"And there's another." The nurse pointed at his side, where a crimson stain was appearing through the material of his pajamas. "You've opened the wound—and now I'll have to put a new dressing on it."

Carewe took a deep breath, and then decided to save it until he could see Kendy, the Unations co-ordinator, in the morning.

"I know I must have seen this on your compcard, but I've forgotten the details," Kendy said. "Tell me, Mr. Carewe—what is your actual age?"

"I'm forty."

"Oh! You tied off quite recently then."

The phrase "tied off" jarred with Carewe and he almost told Kendy not to use it—then he realized what was in the other's mind. It was well-known that very old cools, afraid of death yet tired of life, sometimes were literally overwhelmed by the deathwish. Without conscious volition, they became walking disaster areas where mishap followed mishap until the inevitable fatality occurred.

"Quite recently," Carewe said. "I'm not accident prone, if that's what you're getting at."

"It was just a thought." Kendy surveyed the little ward with distaste, obviously anxious to get away and

attend to more important matters. His pink healthy skin was almost luminous in the morning sunlight slanting through the window. "There was the business in your chalet, then the trouble with the floater on the river, and . . ."

"I'm not accident prone, and I have every intention of staying alive," Carewe interrupted.

"As I said, it was just a thought."

"I appreciate that, but my definition of an accident does not include poisoning and stabbing."

"We recovered the floater from the river," Kendy said with a frown, apparently unwilling to discuss the attempted murder allegation.

"Yes?"

"A pin was missing from the height sensor linkage. When it fell out the sensor thought the vehicle was parked or grounded, and naturally it shut off the power."

"Naturally."

"Well, at least it had to be accidental—there's no way I can think of to make a pin like that fall out at a predetermined point on a journey."

Carewe traced patterns on the bed sheets with one fingertip. "I'm not familiar with the design of your floaters, but I imagine that when one is passing over a river this height sensor linkage gets doused with water."

"It's bound to."

"Supposing someone had removed the original pin and replaced it with one made of, say, gordonite?"

"What's gordonite?"

"It's an alloy which dissolves—almost instantaneously—on contact with water."

Kendy sighed theatrically. "We're back to the mysterious plot against your life. You're suggesting there's a would-be murderer in the base."

"Wrong!" Carewe felt his anger returning. "Yesterday I was suggesting that, now I'm telling you."

"I've made a check on the personnel from every contingent—there's nobody in the base who has a new gash on his face." Kendy got to his feet.

"And how about that little fringe of land surrounding the base? Africa, I think you call it."

Kendy smiled. "I like your sense of humour, Mr. Carewe. There's a very old British joke in which King Darius meets David at breakfast the morning after he had thrown him into the lions' den. The king says 'Did you sleep well?' and David says, 'No—as a matter of fact I was troubled by lions;' and the king sniffs and says, 'All I can say is, you must have brought them with you.'"

Carewe smiled uncertainly. "That's a joke?"

"It baffled me for a long time, too. Then—I'm a student of Nineteenth and Twentieth Century literature, by the way—I discovered the king's final remark was the traditional one made by English landladies when a boarder complained of fleas in his bed."

"It still isn't much of a joke. I was going to ask you what Beau Geste means, but now I don't think I'll bother."

"The point I was making is that if someone really is trying to kill you, it's nothing to do with this Unations base—you must have set yourself up before you came here."

Carewe opened his mouth to argue, but was unable to think of anything worth saying. He watched Kendy's broad-shouldered figure vanish through the doorway and tried to find a pattern in the events of the past few days. The only overall conclusion he could reach was that his whole life had gone to hell almost from the moment he had heard of E.80. Barenboim and Pleeth had both been worried about the possibility of commercial espionage. The elaborate secrecy precautions surrounding his arrangement with them perhaps had not been as effective as they had hoped—when he poured a drink over Ron Ritchie the salesman had been able to make insinuations about his relationship with Barenboim. But, supposing powerful and ruthless competitors had picked up a whisper about E.80, what form would their espionage take? Would they not try to abduct Carewe alive for interrogation and study? How much could they learn from his dead body? And would they also be interested in Athene?

Carewe thumbed the buzzer which summoned the nurse. "When am I being shipped out of here?" he asked when she arrived.

"Dr. Redding has arranged for a vertijet with stretcher accommodation to pick you up this evening. You'll be flying direct to Lisbon." Her tone revealed she had not forgiven him for the disruption of her previous night's routine.

"I see—and it was arranged through the normal channels, was it? Everybody knows when and how I'm going?"

"Not everybody," she said coldly. "Most people wouldn't take the trouble to find out."

Carewe waved dismissal. "That's all. I'll call you if I get attacked again."

"Don't bother."

When she had gone he took the oral communicator from his bedside table and told it he wanted to speak to Farma's transport boss. There was a delay of a few seconds before the connection was made.

"Parma of Farma." Parma's Scots accented voice sounded slightly wary. "Who wants me?"

"This is Will Carewe," Carewe glanced at the ward door and made certain it was closed. "Where are you now, Felix?"

"I'm at the club having a litre of breakfast."

"Will you be meeting a shuttle flight this morning?"

"Yeah—in about fifty minutes from now, if I get there in time."

"You're going to be on time, and I'm going with you."

"But I thought . . ." Parma's voice faded out in puzzlement.

"This is important to me, Felix. Can you go to my chalet, collect my bag, then bring your truck over here in about five minutes?" Carewe poured all the urgency he could into the words. "Without telling anybody what you're doing?"

"I guess so, Willy. What's the trouble?"

"I'll tell you later—just get here."

Carewe put the communicator back and eased himself out of bed. A search of the nearby locker failed to reveal any outdoor clothing. He stood at the

window and watched until he saw Parma's truck nosing its way across the central clearing. Giving it time to draw up to the building's main entrance, he walked quickly to the door of the ward and went out. As he neared the outer door his pendulous right lung picked up the rhythm of the movement and began to bounce gently against his ribs. He walked steadily onwards, got outside without being seen and climbed up into the waiting truck. In spite of his relief, he was illogically resentful of the fact that nobody had noticed his exit.

"Don't get me wrong," Parma said, his breath filling the cabin with the smell of beer. "I enjoy a bit of sport as much as anybody, especially in a Godforsaken hole like this, but should you not be staying in bed?"

"Let's get out of here," Carewe said anxiously watching the hospital door.

"All right, but I don't like it, Willy." Parma let the clutch pedal up violently and the truck spun its wheels in the dust before whining its way across the central clearing with protesting suspension and structure. "And I'll tell you right now that this isn't the best getaway car in the world."

"It'll do." Carewe scanned the base for signs that this unorthodox departure had attracted attention. The base was sleepy under the pressure of sunlight, and the only men visible were two in Unations blue lounging in the shade of an awning. They could have been the two he had seen in exactly the same place on the previous morning. Neither of them turned his head as the truck went past trailing a turbulent wake of dust and dry leaves.

"By the way what have you done?" Parma asked as the vehicle swung into the trail and the walls of trees closed in, reducing the light.

"Nothing. Nothing at all."

"I see." Parma sounded perplexed. "The reason I ask is that I like to know in advance when I'm buying into trouble."

"I'm sorry, Felix." Carewe suddenly appreciated the extent to which he had imposed on a very brief acquaintanceship. "I wasn't trying to duck out of giving you an explanation. The fact is I really have done nothing—unless you count disobeying doctor's orders."

"Why are you go Goddam anxious to meet the shuttle?"

"I'm not just meeting it—I'm leaving on it." Carewe paused. "Do you think that could be arranged?"

"It's hot in here," Parma said glumly. "I should have brought a couple of bulbs."

"How about it?" Carewe persisted.

"This puts me on the spot, Willy. I work for Farma too—and a transport manager isn't supposed to smuggle people around with his cargo."

"I don't want smuggled. Just put me down on your waybill or whatever it is you have"

Parma sighed and the smell of beer mingled with his perspiration became almost overpowering. "What have you got against the afternoon flight Dr. Redding has laid on for you?"

"Nothing—that's why I don't want to travel on it."

"Huh?" Parma swore as the truck hit a pothole and lurched to one side. He wrestled it back into the center of the

trail.

"Somebody at the base is trying to kill me, and they might go as far as planting a bomb on the aircraft."

Parma laughed outright, his silvery bristles rearranging themselves on his red-veined cheeks. "You great tumshie—that's Glaswegian for turnip, by the way—who'd want to kill you?"

"That's what I'd like to know."

"Willy, the only people around here who have anything against you are those ex-Fauves you cooled yesterday, and they can't even get near the base." Parma chuckled delightedly.

Carewe controlled his irritation over the fact that matters of life or death for him produced nothing but amusement and scepticism in others. "This started *before* I went on the expedition," he said. "And last night a man came into the ward and tried to knife me."

"A dream—natural enough after what happened during the day."

"It wasn't a dream. I was attacked." Carewe described his attacker in detail, becoming aware as he did so that his lung was picking up the jouncing rhythm of the truck and nuzzling against his ribs. "Do you mind driving a little slower? I'm resonating again."

"Sure," Parma slowed the truck and glanced sympathetically at Carewe's chest. "You must be real determined to get out of here. I don't know anybody who fits the description you gave, but I guess he could have slipped in from outside."

"That's what I thought—now, how about the shuttle? Are you going to put me on it?"

Parma kneaded his red button nose for a moment. "I like your style with a

pint, Willy, but if it wasn't for that . . ."

"Thanks, Felix—now where's my bag?" Carewe crawled into the back of the truck and took off his pyjamas. The dressings on his ribs looked reassuringly small and secure. He struggled into his clothes and had just returned to the passenger seat when the thunder of vertically directed jet engines drowned the whine of Parma's truck. A silvery aircraft drifted across their field of view, pulled its nose up and sank out of sight behind the trees.

"There's your shuttle—and it's early," Parma commented.

"I didn't realise it was so noisy."

"All VTOL jobs are noisy. It's inherent in the design, but you're used to hearing them going up and down inside tubefields." Parma sniffed heartily. "They don't bother with refinements like that out here."

"What about the pilot? Is there likely to be any difficulty over me?"

"Shouldn't think so." Parma glanced at his watch. It was an old-fashioned radium model but—Carewe acknowledged ruefully—it worked in regions where his radio tattoo could not. "I would say that's Colleen Bourgou. When she's in this part of the world she always flies in ahead of schedule to catch the sun. And I've got to know her pretty well."

"Is that the girl who brought me out here?"

"That's right—I'd forgotten that." Parma nudged Carewe's side. "You noticed her, eh?"

"Yes." Carewe thought back remembering the tawny-haired girl who had so casually removed her shirt

in front of him. He had experienced a guilty excitement then, but it had been slight compared to the pang of uncomplicated lust the thought of her naked torso inspired in him now. They were right about E.80, he told himself, I haven't cooled at all. A few minutes later the truck emerged into the brightness of the airfield. The pilot, who already was sitting on the forward steps, slipped into her shirt with a tan-flashing movement like that of a jungle animal.

"There she is," Parma breathed, and—making his first direct reference to Carewe's apparent status—added, "You had thirty or forty good years in you, Willy. Don't you have any regrets?"

"A few," Carewe said, "but maybe not the sort you think."

CHAPTER TEN

"GOOD MORNING, Colleen," Parma shouted. "Don't stop your sunbath on my account."

The pilot peered up into the truck's cabin, narrowing her eyes against the abundance of light. "I'm stopping it on my account—the sooner you take your shot the better it'll be for everybody, Felix."

"Charming," Parma said in a hurt voice. "That's the thanks I get for preserving myself in readiness."

"Did you say preserving or pickling?"

"You're too sharp for me this morning." Parma climbed down from

the truck and Carewe joined him. "You've met Willy Carewe, haven't you?"

"Yes." The pilot glanced at Carewe and he noticed that the pupils of her eyes, reflecting the direct sunlight, shone like gold coins.

"I want you to give him a ride back to Kinshasa this trip. He has to go home in a hurry."

"Oh? Short stay."

"Willy got a Fauve knife in his ribs," Parma explained quickly. "He shouldn't even be on his feet but, as I said, he has reasons for leaving in a hurry."

The pilot looked at Carewe with new interest, but her voice was doubtful. "I don't mind altering the waybill if you say so, but I'm not operating an air ambulance. Supposing he collapses on the flight?"

"A husky big fella like that? I'll tell you something for nothing, Colleen—this young man . . ."

"Is quite capable of speaking for himself," Carewe cut in. "I assure you I won't collapse, faint or do anything stupid on the flight. Are you going to take me or not?"

"Temper, temper." Colleen looked at Carewe again, and he thought he detected a hint of bafflement in her expression. "All right—get aboard when you're ready."

"Thanks." Noting the girl's expression Carewe felt his masculine ego stir hopefully—was it possible that the outward trappings of a cool were not enough to disguise his virility? He sat down on the truck's running board, and nursed the growing stiffness in his ribs while Parma and the girl unloaded

supplies from the aircraft's cargo hatch. He had been hoping for an immediate take-off but they waited for almost an hour while other vehicles rolled up, received or dispatched boxes and disappeared back into the trees. Most of the drivers seemed friendly with the pilot and from their conversation he deduced they represented a range of contractors to the Unations project—weather control, provisions, ground transport, structural engineering, and the other services required to maintain a technological community in a remote area. Some of the men went inside the aircraft to smoke and talk to the pilot, and Carewe saw them glancing curiously at him. He fretted at the delay and the way in which he had not been able to make a clean, abrupt departure as planned. Any of the men coming and going between the base and the aircraft could be an agent of the hidden power which was trying to snuff out his life . . .

An unusually loud burst of laughter from within the aircraft caused him to jump to his feet and he made the humiliating discovery that he was jealous. On the strength of a few minutes of spurious intimacy and one speculative glance he had built up a fantasy in which he had a special claim on Colleen Bourgou. The logic was that of a fairytale in which a princess, having subliminally recognized a prince behind the outward shape of a frog, is automatically linked to him for life. He snorted in self-disgust. *You really enjoy playing a part*, Athene had told him, *but there's more to it than you walking about in bristles and*

codpiece . . . But that had been before she had thrown everything in her sermon about one-to-one marriages to the winds. Athene had forfeited the right to pass judgement on his foibles. He neared the forward hatch of the aircraft and looked in. Colleen was laughing easily and uninhibitedly at something, and her eyes meeting his were more than ever like discs of newly-minted gold. He smiled back, with calculated wistfulness, and returned to his seat on the truck.

In spite of her free-and-easy attitude, Colleen appeared very meticulous about checking of items of incoming and outgoing payload on her clipboard. The activity around the aircraft gradually diminished until Parma's truck was the only one left. While Colleen was checking the cargo hatch fastenings Carewe said his goodbyes to Parma.

"Thanks for everything," he said. "As soon as I find out what in hell's going on in my life I'll get in touch and explain it to you."

"I'd be interested to hear that, Willy. Look after yourself."

Carewe shook hands, climbed on board and strapped himself into one of the forward passenger seats, just behind and to one side of the pilot's station. He was disproportionately pleased to have it confirmed that there would be no other passengers on the flight.

"Here we go," Colleen said, sealing the forward door and buckling herself in. She activated the control systems with a flashy expertise, fired the turbine starter cartridges and eased the aircraft upwards. When they had

cleared tree level she put the nose down slightly and took off in an ascending swoop which did peculiar things to the emptiness inside Carewe's ribs. He clutched his chest and held on.

"Sorry," she said, glancing back. "Did that hurt?"

"Not really—but I've got a collapsed lung which is so sensitive to acceleration it would stand in as an inertial guidance system."

"How did you get that?"

"It wasn't easy." He described the stabbing incident without consciously slanting it to make himself appear heroic.

"Too bad," she said sympathetically, "but I still don't see why you were so eager to get away from the base."

Carewe hesitated. "Somebody else tried to kill me, somebody in the base." He waited—but the expected laughter did not come. Colleen was frowning and he wondered how he could ever have considered her only fairly attractive.

"Have you any idea who or why?"

"Ah . . . no." Something far back in his mind associated the menace to his life with the fact that he had taken a shot of E.80, but the only person to whom he could confide his worries on that score was Barenboim.

She shivered deliciously. "It all sounds very mysterious and exciting."

"Mysterious it is," Carewe replied, "but I can't see what porpoise, I mean purpose . . . porpoise . . . spoke to me on the dolphin . . ."

"Are you feeling all right?" Colleen turned in her seat. "Your straightness has gone . . . redly."

He stared at her in horror. There was something terribly wrong about the gold coins of her eyes . . . no, not the eyes themselves—the spacing of them . . . there had been a ghastly reversal, and now her eyes were separated by the circumference of the universe minus the width of the bridge of her nose, which left him still on her face but billions of lightyears apart . . .

"Not slowly," she cried. "Unbreathe!"

"Your eyes—the non-Einsteinian simultaneity of blinking."

Colleen's hands were startled birds. "We don't disrequare negative upness."

White winds howling, gravity pushing . . . pushing? Carewe blinked and focussed his eyes on the other passenger seats. They were changing position relative to each other, but this time it was *real* and metal arms were clamped around his body. His single lung pumped like a heart. He looked downwards at the dance of distant treetops, then up again. The shuttle aircraft was flying steadily onwards, a gaping rectangular hole in its belly, far above him now and growing smaller. Around him the other seats rose and sank in response to air currents, or twisted in slow turns, dangling unused straps. Cold clean air seared his nostrils.

"Don't be afraid," Colleen called and he saw her larger pilot's seat drifting close by, fringed with hoses, wires and levers. "The world is pear-shaped and the tip will meet us rotationally."

"What . . . what happened?" He

shouted numbly, clinging to the arms of his seat. A river glinted flatly in the west, and he thought he could see a haze of smoke on the nearer bank. The treetops were close now and rearing up to meet him with daunting speed. "What hit us?"

"Calculation equals chaos," Colleen replied, her voice almost lost in the uprush of air.

"Look out," he warned, "we're almost down." He examined the armrests of his seat and found a small vertically mounted thumb-joystick set in a recess. Memories of a thousand carefully-scanned flight safety booklets returned to him. Pushing the stick downwards would increase the porosity of the invisible forcefield canopy supporting the seat, and increase the rate of descent. Allowing it to spring upwards would intensify the field, and moving the stick laterally would distort the canopy in such a way that the seat would follow the direction indicated.

Carewe flinched as he fell below tree level and an irregular leafy valley surged up around him. He dimly heard other seats crashing through foliage but all his attention was concentrated on the tiny and seemingly irrelevant thumb movements which were supposed to steer him to safety. A smaller tree speared up at him. He pushed the joystick to the right, aiming for a patch of dimness, but the response was sluggish and the seat slanted down through the tree's branches. It bounced and shuddered and slowed, while twigs lashed at his face—then he was on the ground, miraculously seated upright. The sound of other seats tumbling through

foliage was loud. He hit the release button, the seat's metal claws curled back into their sockets and he stepped clear.

"Hello there!"

He looked upwards and saw that Colleen's seat was perched at an angle in the lower branches of a broad tree. She was about eight metres up, but appeared to be smiling.

"Hold on," he called. "I'll climb up to you."

"It's all right. No calculation, no chaos." Colleen released herself from the seat and stepped off into thin air. She hurtled downwards, legs rotating lazily and tawny hair streaming, and smashed into a clump of shrubbery.

Carewe ran across the uneven ground and parted the shrub with shaking hands. She was unconscious and a single rivulet of blood, gleaming like laquer, crossed her forehead. He raised one of her eyelids and touched the eyeball with a fingertip. The eye remained passive, indicating to Carewe's limited medical understanding that she was deeply unconscious, perhaps concussed. He explored her limp body with his hands and, finding no broken bones, lifted Colleen out of the shrub and put her down on mossy ground.

Sinking to his knees beside her, he surveyed the scratches on his own body and tried to come to terms with reality again. The only explanation he could conceive was that a fast-acting hallocigen had been released into the shuttle's air system by a timing device. It had not been Illusogen or any of the other approved commercial drugs, but one specifically designed to interfere

with a person's spatial awareness and orientation—a lethal property in the context of an aircraft in flight. It appeared to have hit Carewe first, perhaps because his single lung was working at close to maximum capacity, and to have left his system earlier for the same reason. Colleen had been given sufficient advance warning to let her blast them out of the aircraft, but the effects had still been with her when they landed, hence her attempt to walk on air.

Murder bid number four, he thought. And the person responsible had been ruthless enough to try sending an innocent woman to her death as part of the same package. His helpless, smouldering anger returned in full force. A combination of circumstances had saved his life again—but his luck could not hold out for ever . . .

A new thought obtruded. He was assuming the latest attempt had failed, but was it possible that he was as good as dead already? The shuttle had flown steadily south-west with mechanical insouciance. Perhaps its engines—drawing moisture from the air and converting it to fuel—would carry it far out across the Atlantic. In that case there was nothing that Carewe knew of to guide a rescue party to the spot where he and Colleen had come down. He was stranded possibly a hundred kilometres from the nearest settlement, in the sort of terrain in which a man would be lucky if he covered ten kilometres a day. With an injured woman to care for his progress could be cut to a fraction of that.

The throb of winged insects in the

heavy air took on a malicious note and grew louder in Carewe's ears, making constructive thought difficult. He pressed his hands to his temples. The river he had glimpsed during the paradrop, presumably the Congo, lay to the west—and there had been a faint smudge of smoke which might indicate a village. He looked down at Colleen and patted her face hopefully, but it remained inert as wax, almost a stranger's now that her personality was no longer imposed on the features. A feeling of having just arrived in Africa, of having been plucked out of Three Springs only a few seconds earlier came back to him. The continent's shocking strangeness began in the unfamiliar mosses beneath his knees and radiated for thousands of kilometres in every direction, compounding mystery with hostility. And he, Will Carewe, was not equipped to cope. He had no rights in Africa, not even the right to live, therefore he had no obligations. The mood of resignation lasted for some seconds, then was replaced by the abiding anger which was becoming a permanent feature of his mental make-up.

He slid his hands under Colleen's body, lifted her carefully, and began walking west towards the river.

There was perhaps an hour until sunset—no possibility of reaching the river before dark—but he had a compulsion to be on the move. Within a matter of minutes he was drenched with sweat and his working lung felt as though on the point of bursting. Progress was even slower than he had imagined. The forest floor had variations in height of many metres,

and where undergrowth and vines failed to block the way the sheer impossibility of climbing steep slopes forced him to make a detour. He kept going doggedly, learning not to set Colleen down during rest periods but to support her against tree trunks and thus avoid the punishing task of having to lift her all over again. The continuous background sounds of monkeys and birds sometimes faded to an echo of happenings in another universe.

By the time darkness was assembling its watchful forces among the tree lanes his legs were becoming incapable of supporting any weight. With his breath coming in roaring gasps, he looked round for an approximation of shelter. Colleen stirred sleepily in his arms and moaned. He set her down, almost collapsing in the process, and watched for further signs of returning consciousness. She moaned again, shivered and moved her arms aimlessly. Her eyes, partly open, were crescents of white and the shivering grew more violent.

"Colleen," he said urgently, "can you hear me?"

"I . . . I'm cold." Her voice was that of a small child.

"Don't worry. I'll . . ." He took off his tunic, draped it over her and surveyed the darkening diorama of the forest. The air was cooling rapidly and the only available materials were grass and leaves. He gathered armfuls of long grass, mixed with the broadest leaves, and piled them on her legs and up over the tunic. By the time he had finished the darkness was virtually complete and it was his turn to shiver.

He slid himself under the tunic, disturbing the covering of vegetation as little as possible, and took Colleen in his arms. She moved against him with an easy, natural movement, one of her legs creeping over his, and the warmth returned to his body. He lay perfectly still, closed his eyes and tried to relax. Minutes, perhaps hours, slipped by as he sailed the shallows of the ocean sleep. During his periods of consciousness the brilliant lanterns of the stars were not above, but ahead—he was pinned to the foremost point on a runaway world, plunging dangerously through a crowded galaxy. Eventually he became aware that Colleen was awake.

"Will Carewe?" she said.

"Yes." He made his voice calm. "You're going to be all right."

"What happened? I've got the craziest memories."

"I'm afraid I involved you in my own particular mess." He told her his theory of how the incident had begun and added a summary of the subsequent events.

"And now you're trying to carry me all the way to the Congo River?"

"Well, you aren't all that heavy—we probably covered two kilometres." He realized she had not withdrawn the leg which was lapped over his, and that her breasts were firm in their pressure against his side.

She chuckled warmly in the darkness. "You're hopeless, Will Carewe. Didn't you . . .?"

"Didn't I what?"

"Oh, nothing. Do you think we have much hope of reaching civilization on foot?"

"I don't know," he said ruefully. "I was hoping you could tell me that."

Colleen waited a full minute before she replied. "I can tell you one thing."

"What is it?"

"That you aren't a cool."

"Oh!" He considered arguing, but his body was offering her the most basic evidence of all. "Are you angry?"

"Should I be?"

"Well, I watched you sunbathing when we arrived."

"I don't think that's the reason you drag about—besides, I had an idea even then. Have you fooled many women?"

"Lots," he assured her.

"They can't have been real women, Will." The words were accompanied by a gentle persuasive thrust of her loins which nothing in the world could have prevented him returning. Her mouth met his eagerly, and from her lips he drank a heady brew of warmth and reassurance. *Reassurance*, mind asked body, *was that a good enough reason?* He tried to stem the tide long enough to consider the reasons against the giving acceptance of the moment. Athene? She had changed the rules of the game. Colleen herself? He touched the dried blood on her forehead.

"You've been hurt," he whispered. "Is this fair?"

"I'm an immortal, and immortals heal fast." Her breath was hot on the roof of his mouth. "Besides, we may never get out of here."

"All right," he said, rolling over her, transferring his weight to the pliant platform of her hips. "We both win."

In the dawn—when they had helped

each other to dress—Carewe took Colleen's arm and began moving towards the west, but she pulled back.

"Not that way," she said, "we've got to get back to where we landed."

"What good will that do?"

"The aircraft seats are standard Unations models for bush operations—there's a radio beacon in each one, and it starts broadcasting as soon as a seat is ejected."

Carewe caught her by the shoulders. "You mean we aren't lost?"

"Did I say we were?"

"Last night you said we might never get out of here," he accused.

Colleen gave an elaborate shrug. "We might have been bitten by poisonous snakes."

"You little . . ." He shook her, trying not to grin. "Why didn't you tell me that last night?"

"Well . . ."

"Was I being a bit steely and noble?"

She laughed and threw her arms around his waist. "Don't be ashamed of it, Will—you play the part too well. You can tell your wife you were tricked by an unscrupulous bush pilot."

"What makes you think I have a wife?"

"You have, haven't you?"

"I am married. One-to-one. Does it matter?"

Colleen hesitated, and before she could answer there was a sound of aircraft in the east. "We'd better hurry—they'll be looking for us, and there'll be questions."

"I guess so." Carewe frowned. The prospect of rescue meant an immediate return to problems which had grown

even more complex. His plan for a speedy and inconspicuous return to Three Springs could hardly have gone further wrong. The loss of an aircraft was going to focus a lot of attention on Carewe, advertising his whereabouts to the occult hunters and perhaps imperiling the secrecy of E.80.

"What's wrong, Will?" Colleen's eyes sought his. "Was it so terrible for you?"

"It was wonderful," he said earnestly, "but this mysterious and exciting life of mine gets more complicated by the minute. The reason I jumped the shuttle in the first place was that I wanted to get home quickly."

"You mean, if you have to hang around in Kinshasa you might get killed?"

"There's even more to it than that, but I can't explain."

"Let's go then," Colleen unwrapped her arms and began to walk. "I've got friends in Kinshasa—they'll get the formalities out of the way in a hurry and let you keep moving."

"Formalities!" Carewe started after her. "How often do you lose an aircraft anyway?"

"The aircraft isn't lost," she said scornfully. "What do you think autoland systems are for? The shuttle would have landed at Kinshasa yesterday. Not as neatly as I would have done it, but still in one piece."

"And full of hallucigenic gas?"

"I doubt it—the environment control system completely renews the air in the cabin every four minutes."

"Does it?" He helped Colleen over a break in the ground. "The people who

are gunning for me haven't left much solid evidence so far. If the gas container was made of a self-consuming plastic there'd be nothing . . . But why did we abandon ship?"

"I'll blame it on a system failure—it should take them about two days to sort that one out."

"I wish I was mechanical," he said in wonderment.

"Think of all the fun you'd miss," Colleen replied wickedly. She moved ahead of him again, easily, the muscles on her sturdy yet shapely legs firming at every step. They took their bearings from the sound of the helicopter and reached the area where they had paraded in roughly fifteen minutes. Carewe's clothes were soaked with dew flung by whipping leaves when they reached the first of the empty aircraft seats. It was lying on its side at the base of a tree. The helicopter hovered patiently above the canopy of foliage which dipped and swayed in the downdraft.

"Where's my seat?" Colleen said.

Carewe looked around for a moment and pointed up at the seat, still caught at an angle in the branches of the tree. "There you are. Or were."

She whistled. "You mean I just stepped off from there?"

"Yup. You scared the pants off me."

"Well, you must admit it's a new twist. I'll tell the other girls what to do next time they fly this route."

Carewe had difficulty in forcing a smile. Colleen was beginning to talk like all the frustrated women he had known, the sort who often ended up joining Priapic Clubs—yet she had

seemed so different. The change, he suddenly realized, had begun when she asked if he was married. He watched with concern as she climbed the tree and swung lithely out to where the seat was perched. She took something from it, raised it to her mouth and he heard her voice faintly above the sound of the copter. A minute later she was back on the ground, tucking her blue shirt into the waistband of her skirt.

"They're dropping a couple of baskets for us." Her voice was casual.

"Colleen," he said quickly, "this might be the last chance we'll have to talk privately."

"Could be."

He caught both her hands. "I've been married for ten years, and last night was the first time I broke the contract. The only time." She tried to pull her hands away but he held on. "But I'm not sure if I have a wife anymore. Something happened. I can't tell you what it was—but my being in Africa trying to look like a cool and trying to keep from getting murdered are all part of it."

"Why are you telling me all this?"

"Because I don't want you to think I'm scuttling off to a cozy home and a cosy wife after a casual bit of fun. I'm not a casual person."

"But why are you telling me *that*?"

"Because you're important to me. I could love you, Colleen."

Her eyes challenged his. "You think so?"

"I know so." His words saddened him because they were almost, but not quite, true. He was grateful to Colleen, and gratitude which could not be properly expressed transmuted itself to

guilt. "Look, if I find out I no longer have a wife . . ."

"Don't say it, Will." She gave him a wry smile. "Don't get too noble."

He released her hands and, by instinctive agreement, they stepped away from each other as two cages came blindly down through the trees from the waiting helicopter.

CHAPTER ELEVEN

IT WAS NOT until he was high above the Atlantic on a west-bound subspacer that Carewe began to relax. Rather than delay his movements by going through the channels to arrange Farma credit, he used his own disk to pay for the flight from Kinshasa to Lisbon, and for the jump from there to Seattle. There had been one uneasy moment in Lisbon when he heard that the flight was going to set him back more than a thousand newdollars—he had an idea his drawing account would not be able to cope. The computer network gave its assent, however, and he remembered the value of the newdollar was exceptionally high in comparison to the escudo that month.

One of the side effects of immortality had been the necessity to redesign the world's monetary systems. Even without the consequent increase in productivity, the median income for a consumer unit in the U.S.—estimated at 5,000.00 in the mid-20th century and projected at a conservative growth rate of 2.5 percent—would have risen to more

than eight million dollars a year in three centuries. The advent of biostats, leading to optimum use of brainpower and resources, had pushed the annual income in productivity to the region of ten percent and incomes of a billion dollars a year began to be forecast. To prevent the dollar becoming a meaningless unit, its value was redefined as a fixed fraction of the gross national product, calculated on a monthly basis. The other countries of the world adopted similar measures by international agreement and a Unations monetary reservoir was created to absorb disparities among the currencies of various countries.

The subspacer was biting down into denser levels of air when Carewe, slumped in his seat, made an odd discovery. He had flown something like five thousand miles without once imagining an imminent failure in the aircraft. The possible dangers of aviation were nothing compared with his experiences on the ground during the previous two days—and he had survived those. He had been placed in situations where his life depended on his own efforts, and had been equal to them. The thought filled him with a dull astonishment which still lingered when he got off the skycraft at Seattle. Thanks to the time gain of the east-west flight it was only late afternoon, and he was able to pick up a commuter flight which got him into Three Springs by dusk.

The pastel-colored buildings were darkening, their mirrored windows and view-walls reflecting the copper-and-green sky. The world looked hearteningly familiar once again, and

Carewe's sense of being in danger lessened in intensity. All he needed now was the knowledge that Athene was at home waiting for him, and the African interlude would fade like a dream. He picked up his bullet at the airport garage and drove home slowly. The home was in darkness, as he had known it would be, but not until he saw it did he admit his secret hope that Athene would have returned. He let himself in and turned on the lights. She had tidied up carefully before leaving and the interior looked as though it had never been lived in. The air felt sterile.

How did I let it happen? Carewe was appalled at his own stupidity, at his crass mismanagement of the circumstances. With the cloud of E.80 curling safely through his veins, he should have called Barenboim and let him convince Athene of the truth. What he had done was to sacrifice his marriage to protect Farma's investment—and the sacrifice had been needless because other people appeared to know about E.80, or at least to suspect something. Carewe was tired, and his operative lung was pumping hard as though he had been running, but he decided to go to Athene and put things right again. If necessary he would take her to see Barenboim—but there was a simpler, more pleasurable way of proving to her that he was still a functional male . . .

He crossed to the communicator, gave it the number of the commune in which Katrina Targett—Athene's mother—lived, then cancelled the call before the connection was completed. The commune was less than fifteen kilometres away and he could drive

there in a few minutes. It was more than two years since he had been there but he was able to punch the buildings combined communications and grid number into the bullet's wayfinder and let it call out the route to him as he drove. Full darkness had fallen by the time he pulled up outside the two-storey structure, which was of a standard pattern issued to women who wanted to live together on a group basis. It had separate apartments to cater for closely knit mother-and-child relationships and for short-term pairings with itinerant males, but the other aspects of life were largely communal. Carewe disliked the place, mainly—he suspected—because his own mother had continued to live in a individual unit after his father had drifted on to new liaisons.

He found the outer door open and went through it into a rectangular atrium where a slim brunette, apparently in her mid-twenties, was tending a flower garden. She looked as though she might have been Athene's mother, but Carewe—whose memory for faces was poor—could not be certain.

"Madam Targett?" He went closer. "Are you Athene's mother?"

She looked up with a smile which did not quite hide the coolness appearing in her gaze as she noticed his hairless chin. "No."

"I'm sorry. I thought you looked . . ."

"Like one of the family?" Her voice was deep and warm. "I am. I'm Athene's grandmother. Who are you?"

"Will Carewe. I didn't realise . . ."

"Oh, we go back for generations

here. There's a lot of old-fashioned family loyalty among the Targetts." The woman dropped a seed into the moist earth, turned a hand-held biotrophic projector on it and watched critically while a shoot snaked out of the ground, spread leaves and blossomed, as if in a speeded-up film.

"That's . . . nice," Carewe said awkwardly. He had always been repelled by the idea of children remaining emotionally fixated on their mothers who themselves were children bound to their own mothers, and so on. Some communes had eight generations of women, reminding him of an endless series of nesting dolls. "The family unit can still be important."

"Yes." The woman, who had not introduced herself by name, switched off her projector. She knelt to examine the new flower, hissed with annoyance and pulled it out of the soil. She threw the flower down on the earth where its pale roots waved feebly like threadworms. "I made it too tall. When I don't concentrate I make them too tall."

"Sorry." Carewe watched the blindly seeking roots as the woman moved a control on her projector and turned it on the flower again. It blackened and dissolved, returning its constituents to the soil. "Takes all the work and waiting out of gardening, doesn't it?"

"If you don't approve, Will—and I can tell you don't—you should come right out with it."

"Who said I don't approve?" Carewe laughed unconvincingly, looking at the stained soil, somehow reminded of the frog he had rescued

from death in the Farma parking lot.

"Athene told us you were a latent Luddite."

"As long as it's only latent," he fenced, wondering what a Luddite was, "I don't suppose I'll get arrested."

The woman sniffed. "Well? Where's Athene?"

"That's what I wanted to ask you."

"How should I know, Will? She left here yesterday right after she got your call." The woman stood up and peered into Carewe's face. "You mean she isn't . . ."

"I was in Africa yesterday," he said harshly. "I didn't call anybody."

"Then where is she?"

Carewe hardly heard the question, but the words pursued him the whole way back to his home.

A careful search of the dhome yielded nothing in the way of clues—he could not even decide if Athene had visited the place on the previous day. There were no recorded messages, no notes. Nothing. Suddenly short of breath again, he hurried to the communicator and gave it the number of the Farma headquarters. A three-dimensional cartoon of a traditional female secretary appeared at the set's projection focus.

"I am sorry, caller," she said in a perky voice, "but it is past normal business hours and the staff of the Farma Corporation have ceased work for the day. They will be at your service tomorrow morning again promptly at nine-thirty."

"I have urgent company business with Mr. Barenboim."

"I will assist you as much as possible.

Have you a priority code?"

Carewe gave the intentionally complex coding which was memorized by all of Farma's senior staff for use in making emergency contacts. The secretary, a vision in the mind of the Farma computer, nodded thoughtfully. "Mr. Barenboim can be reached at the home of Mr. Emmanuel Pleeth until approximately midnight. Shall I connect you?" She faded away, dissatisfied, into a luminous haze as Carewe switched off. His first impulse had been to call Barenboim, but if Athene's apparent disappearance had anything to do with the E.80 project he wanted to move as carefully as possible. Communicator link-ups were difficult to tap, but he had no doubt it could be done.

He went back out to his bullet, walking quickly with his newly learned and slightly uncoordinated gait which allowed him to move at a fair speed without the inert lung swinging against his ribs. His knees felt rubbery, a reminder that he had eaten practically nothing in two days. Never having visited Pleeth's home, he had only the vaguest idea where it was, but the bullet's wayfinder got an address and instructed him on the best way to get there. Half an hour later he swung through the gates of a compact estate about ten kilometres to the north of Three Springs. The house was a low sprawling structure of genuine stone. Warm light spilled from its windows across terraced lawns. The lushness of the vegetation and the unseasonal warmth of the night breeze told of an environment control system extending over the entire estate. Getting out of

his bullet, Carewe looked around him in wonderment, inhaling the scented air. A vice-president of Farma was bound to be in a high-income bracket—but Carewe had not realized just how well the tautly-smiling Pleeth could live. He crossed a patio and was about to reach the main entrance when the door opened. Barenboim hurried out, his hands outstretched towards Carewe, while Pleeth's pink enigmatic face watched from the doorway.

"Willy! My dear boy!" Barenboim's eyes sent messages of anxiety from within their bony grottoes. "What are you doing here?"

"I have to talk to you, Hy." Carewe noted Barenboim's display of solicitude, understood the other man was making it obvious for his benefit, but was unable to doubleguess the two-centuries-old cool any further.

"Please do—come in and sit down." Barenboim gripped his arm and led him in as Pleeth moved silently ahead. "I got wind you had been injured and hospitalized in Africa, then there was something about your having disappeared. We were worried." They entered a large book-lined room in which pools of soft light shone richly on wooden furniture. A small world-globe sat on the central table. Carewe allowed himself to be installed in an easy chair before a convincingly real log fire.

"I haven't disappeared," he said. "But my wife has."

"A woman can't disappear these days, Willy. They always leave a clear trail of credit transactions in the . . ."

"This is serious," Carewe snapped, discovering to his surprise that the awe

which Barenboim used to inspire him had completely vanished.

"Of course, Willy. I didn't mean to . . ." Barenboim glanced at Pleeth, who was standing in a corner of the room listening intently. "Perhaps you'd better tell me what's been going on."

"Somebody's been trying to kill me—and now Athene has disappeared." Carewe paused to examine Barenboim's face, then went on to outline the events of the past two days.

"I see," Barenboim said when he had finished. "And you think it is something to do with the E.80 project?"

"What do you think?"

"I'm sorry to say it, Willy," Barenboim's face was a mask of concern, "but I'm inclined to agree with you. This is exactly the sort of thing we've been doing our best to avoid."

"But . . ." Carewe had been hoping to have his theory dismissed. "If somebody has abducted Athene, what would they do with her?"

Barenboim went to a sideboard and poured a drink. "If you've got any ideas about them harming her—forget it. The sort of studies a researcher in biostatistics would be interested in all involve maintaining the subject in perfect health."

"What sort of things?"

"Is Scotch all right?" Barenboim handed the drink to Carewe. "Manny here could give you a better run down than I, but basically they would want to assure themselves of the normal development of the fetus. That's pretty

important—ever hear of thalidomide?"

"Ah . . . no."

"Then there's the question of heredity. Supposing the child is male—will its cell structure and replication mechanisms be those of a mortal or an immortal? Supposing the male offspring of an E.80 immortal, a functioning male, turned out to be non-functional males?"

"I can't see that it would change things very much," Carewe said impatiently.

"Perhaps not, but I'm merely trying to give you some idea of why a rival organization would be interested in studying your wife. These are things we want to know too. The important point is that she will be perfectly safe until we can locate her and get her back."

"Right!" Carewe swallowed his drink and stood up. "I'll contact the police immediately."

"I don't think you should do that," Barenboim said, and Pleeth moved restlessly in his corner.

"Why not?"

"I'll be frank about our position, Willy. You're too hard-headed for me to be anything else and hope to get away with it. If the police are brought in at this stage the whole world will know about E.80 by tomorrow morning. We want to give it to the world but not in such a way that all our rivals will be able to reap the benefits of our . . ."

"In the meantime thousands of men are tying off every day," Carewe cut in angrily, thinking of the tribesmen he had forcibly emasculated.

Barenboim shrugged. "It's better

than dying off—but you didn't let me finish, Willy. You're entitled to go to the police—and I wouldn't dream of trying to stop you, in spite of what it would mean to Farma—but I have an alternative to put to you."

"I'm listening."

"In my opinion, a really good private agency could find your wife quicker than a horde of well-meaning but noisy police officers, and that way both you and Farma would be better off. I know the right man to undertake the work and I'm prepared to call him this minute. All I ask is that you give me one week to try it my way. After that, if there are no results, you can bring in the police. What do you say, Willy?"

"Well." Looking at Barenboim's eager, concerned face, Carewe's conviction that he was being manipulated returned to him briefly, but he had to recognize the force of the arguments. "Are you sure your man's the best?"

"The *very* best—and I'll call him right now."

"There's no communicator terminal in this room," Pleeth put in, speaking for the first time. "You can use the set in the main lounge. Through here."

"That's the trouble with trad architecture—it's all appearance and no convenience," Barenboim sighed. "Pour yourself another drink while we make the call, Willy. I'm sure the host won't mind. Will you, Manny?"

"Be my guest." Pleeth's, pink-stained eyes locked with Carewe's, and the thin upcurving line of his mouth tightened its radius as he exulted over secret triumphs.

When the two men had left the room Carewe took another drink, savouring its malty warmth. He walked to the table and examined the globe of the world. It was small—about the size of an orange—cupped inside a complex gimbal arrangement surmounted by a lens system, and the arrangement of the land masses was all wrong. He looked at it more closely and saw that everything was reversed, as if seen in a mirror. The surface of the globe was grayed with thousands upon thousands of place names, all of them far too small to be read with the naked eye. Carewe examined the base of the globe's stand and discovered two rows of buttons with the legends "Latitude" and "Longitude." Impressed with the beautiful engineering of the device, he touched a larger red button. The globe swung to pre-set co-ordinates and the lens system blazed with light.

Carewe looked up at the portion now being projected onto the ceiling of the room, taking a sip of his drink as he did so, but the liquor seemed to lose its taste as he saw that the African township of Nouvelle Anvers was in the center of the brightly glowing map. For some reason, at present known only to themselves, Barenboim and Pleeth had been studying the small area of the continent in which Carewe had come so close to losing his life.

He switched off the projector and returned to his seat, anxious to appear at ease before his employers returned to the room.

CHAPTER TWELVE

CAREWE, who had never

knowingly seen a private detective before, studied Theodore Gwynne with interest. He was a small, quick man who appeared to have cooled around the age of fifty. His eyes were alert, and he had a brain which seemed to race all the time, obsessively, with the object of producing witty comments on everything that was said. Carewe could see him seizing on even the most banal remark and worrying it like a terrier until he had torn off an aphoristic shred. Every conversational exchange among the four men in Pleeth's library ended with one of Gwynne's epigrams, delivered in a low voice and accompanied by a very white smile. Carewe had initial doubts about the little man's qualifications, but he noticed that Barenboim spoke to him with some deference and listened attentively to every word of Gwynne's replies.

"As I see it, Theo, we're giving you two jobs to take care of at once," Barenboim was saying thoughtfully, pressing his puffy hands together to form a steeple.

"Two jobs, but you'd get a hell of a shock if I sent in two bills." Gwynne's teeth flashed briefly. "Sorry, Hy—carry on."

Barenboim smiled tolerantly. "We're asking you to find Willy's wife. Then there's the question of Willy himself—he's convinced someone has been trying to kill him."

"That's bad." Gwynne sent Carewe a sympathetic glance. "There's only one thing more depressing than somebody trying to kill you, and that's somebody succeeding."

Carewe nodded in sage agreement.

He had noticed the way in which Barenboim had made clear his reservations about the reality of the threat to his life. One part of his mind was annoyed at not being able to convince anybody that he was a murder target; but the log fire was warming his feet, the Scotch he had drunk was warming his stomach, and a delicious relaxation had spread through him, turning his weariness into a sensual pleasure.

"There's no problem," he said sleepily. "I want to work closely with Theo while he's locating my wife. He'll be able to look after my health at the same time, I presume."

"Dr. Gwynne, I presume." Gwynne rubbed his hands. "I'll be able to put in an additional bill for medical services."

"That reminds me, Willy—you're still convalescing," Barenboim said. "Have you seen a doctor here yet?"

"Not yet. I'm getting used to operating on one cylinder."

"Well, it sounds pretty serious to me. I'll send a company medical officer out to see you."

"Don't bother, Hy." Carewe's newfound distrust of hospitals flared up. "I'll see my own doctor in the morning."

"All right. Have him debit Farma."

"Thanks, Hy." Carewe caught himself on the verge of drifting into sleep. "I'd better get on home."

"There's no need for that." Pleeth, who had been perched with uncharacteristic stillness on his invisible QueenVic chair, spoke with an odd intensity, as he fingered the cigar-like gold ornament on his chest. "The least I can do is offer you a bed."

Carewe shook his head. "I'd prefer to get back to my own place—that's where Athene would expect to find me." He stood up and, after making sure that Gwynne had his home number, made his way out to his bullet. By the time he got home his legs were buckling slightly at every step and he fell asleep on the instant of lying down.

In the morning he awoke to find that his fears for Athene's safety—so easily dispelled by Barenboim's arguments on the previous evening—had returned in full force. According to the president's logic nobody had any reason to harm Athene, but by the same logic nobody had any reason to harm Carewe. Yet he had come close to death three times in one twenty-four hour period. Although not hungry, he took a light breakfast of eggs and citrus juice, then went to the communicator and called Dr. Westi's office. He arranged an appointment for ten o'clock and filled in the intervening time by renewing his facial depilatory and finding fresh clothes.

Dr. Westi's office was on the eighth floor of the Three Springs medical arts building. Carewe arrived there a little early but the cybersec admitted him right away. Westi, a scholarly-looking man who apparently had not cooled until he was over sixty, waved him into a chair.

"Good morning, Will," he said amiably. "Having adjustment problems?"

"How do you mean?"

"I see from your compcard that you and Athene have just been registered

as immortals with the State Health Board. I thought perhaps . . ."

"Oh, I see what you mean. No sex isn't rearing its ugly head—but can you do anything for a collapsed lung?" Carewe explained what had happened to him as best he could without going into the reasons for his abrupt departure from the Unations field hospital.

"I suppose I should be grateful to you, young Will," Westi said, eyeing Carewe speculatively. "In nearly eighty years of practice this is my first opportunity to treat a stab wound. Take off your tunic while I see what they've been doing to you." He activated a desk-mounted computer terminal and asked it for details of the treatment Carewe had been given during his African hospitalization. After a barely perceptible delay, the instrument slid out a tongue of paper which Westi examined with interest. He set it aside and removed the dressing from Carewe's chest. Carewe avoided looking downwards as the doctor's warm dry fingers touched the area of the wound.

"This looks all right," Westi said finally, his voice shaded with doubt. "Exactly how long is it since you took your shot, Willy?"

Carewe did some mental arithmetic. "Ten days."

"I see. And who supplied the gun?"

"I work for Farma," Carewe said, keeping his voice level in spite of his stirrings of apprehension, "so naturally . . ."

"Farma E. 12, was it?"

"Of course—why do you ask?"

"Nothing important. The rate of

healing was perhaps a little slower than I'd have expected for an immortal. Probably there were complicating factors. Now sit here while I check up on that lung." Westi put a holoviewer against Carewe's ribs and examined the right lung. Carewe, appalled at the idea of accidentally catching a glimpse of his own interior, kept his eyes closed. "That looks healthy enough—I think we can put it to work again."

"What do you have to do? Pump it up?"

"Nothing so drastic." Westi smiled. "I'm going to inject some adhesive into your thorax and re-attach the lung to your ribs. You won't feel a thing."

Carewe nodded glumly, and tried fixing his thoughts on Athene's face.

Creeping downwards from zenith, the sun changed shape as it crossed the invisible boundaries of the weather control zones. Like an amoeba, a drop of oil moving on glass, it distorted, elongated, split into bloody tears and coalesced. The fading forces of winter, defeated by orbital geometries, glowered from the north but were held in check. Carewe walked aimlessly in his garden, trying to adjust to the new tempo of events. Since the first morning he had been called to Barenboim's suite the days had been uneven flickers of light and darkness, slipping past him at supernatural speed. Now, suddenly, he was trapped in a temporal amber, waiting for Gwynne's call. He walked the length of the garden several times, toying with the idea of doing something with the hummocks of Martian lichen which were getting out of control, but unable

to give serious consideration to anything so trivial.

"There you are, Willy," came a man's voice from the next garden.

"Where have you been lately?"

Carewe turned and saw the sun-browned face of Bunny Costello looking over the fence. "Africa," he said, vainly wishing he had detected Costello's presence in time to avoid contact. His neighbour was the oldest man he knew, even older than Barenboim—he had been born in the earlier half of the Twentieth Century and the development of biostats had come just in time, in Carewe's estimation, to save him from the grave.

"Africa, eh?" Costello snorted in disbelief. "Mrs. Carewe with you?"

"What have you heard, Bunny?"

"Heard? What about?"

Carewe sighed heavily. "About Athene and me. What have you heard?"

"Not a thing. Besides I don't repeat gossip—I'm all in favour of old-fashioned marriage, Willy boy."

So they know, Carewe thought. "Why don't you try it?"

"Cruel, Willy. Very Cruel. I was married, you know."

"Really?" Carewe began to move away.

"Yeah—but I can't remember her face. Or even her name."

The afternoon air was suddenly cool on Carewe's forehead. "That's some memory you've got there, Bunny."

"It's as good as anybody else's—goes back about a hundred years."

"But I know men who can remember twice that far back." *What's the point?* Carewe wondered. *What*

use is your million tomorrows if you can't hold on to them?

"Continuity is everything," Costello said, shielding his eyes from the sun.

"Memories have to be reinforced, you know. I kept a diary for some time, and a photograph, but I lost them. Travelled a bit too, and lost continuity. Do you keep a diary, Willy?"

"No."

"Start. All I need is one clue. One clue and I'd win back fifty years, but I was in South America during the Unification and nobody can find my records."

"How about hypnosis?"

"No good. The cellular imprints have gone. They get swamped out eventually, even in mortals, and it's my guess the biostats speed up the process." Costello smiled ruefully. "Aging and remembering might be the same thing, Willy boy. And if you stop aging . . ."

It took Carewe a long time to break free of Costello and get back to the privacy of his dhorne. He took a shower, then made some cofftea but the depression which had come over him while talking to the old cool refused to disperse. Could it be that there would come a day, perhaps only a hundred years in the future, on which he would have to check his diary to remember the color of Athene's hair? Without absolute continuance of the personality was there such a thing as immortality? Or did it simply mean that his deathless body would be inhabited by a series of strangers, each fading imperceptibly into the next as the biological slates were wiped clean?

Acting on the spur of the moment,

he searched drawers and closets until he found a fresh notebook. At the top of the first page he wrote, "28 April 2176." He studied the blank white sheet, tapping the pen against his teeth, but was unable to decide on what to say or how to say it. Flowing confidences beginning, "Dear Diary"? Or should he be cryptic—"Wife pregnant today, father unknown"—and hope the Carewe of a century later would be able to reconstruct the fragments?

He threw the notebook aside, went to the communicator and instructed it to check itself. All circuits were operable. Dissatisfied and tense, he walked around the dhorne breathing deeply and steadily to test the action of his right lung. It appeared to be working well and there was no discomfort from the punctures Dr. Westi had made in his chest. He was ready to do anything if only Gwynne would call. The thought came that it could take Gwynne several days even to pick up a lead, and he groaned aloud. If this was a sample of immortality . . .

The call came a little after nine o'clock. Carewe had at length drifted into a restless sleep and he sat up in darkness, the chime of the communicator fading in his ears. There was a moment of disorientation as he saw the glowing image of Gwynne's head drifting at the set's projection focus, then it all came back. He lurched across to the communicator, shivering, and told it he was accepting the call.

Gwynne's blindly questing eyes came to life. "There you are, Will. Did

I waken you up?"

"Sort of. I'm feeling a bit rough."

"You look like you've been shot at."

Gwynne's face contorted into a theatrical scowl. "Who said 'Fire at Will'? Come on, speak up—who said it?"

"Have you any news of my wife?"

Carewe said stolidly, wondering what miracles of competence the little man had achieved in the past to win Barenboim's esteem.

Gwynne instantly looked contrite. "No hard news, but I've got a strong lead."

"What sort of a lead?"

"Well, I started with that call your wife received—the one that was supposed to come from you. It was made from a public commset in the Three Springs civic services block."

"That gets us nowhere, doesn't it?"

"In this line of business getting nowhere often means getting somewhere. There aren't any drug manufacturing concerns in the Three Springs area apart from Farma—correct?"

"That's right."

"So I contacted a few friends on the computer staffs of the credit clearing houses—on the quiet, of course—and I found that a character by the name of Solly Hyman had been in town for one day. Hyman comes from Seattle and he does casual work for an agency called the Soper Bureau."

"These names don't mean a thing to me."

"Probably not—but I happen to know that Soper is retained by a firm called NorAmBio."

"I'm with you now." Carewe felt the

hair on his temples stir slightly as his heart began to pound. NorAmBio was a middle-sized pharmaceuticals company heavily committed to biostatic production and research.

Gwynne's teeth flashed white. "There's more. Last year NorAmBio's engineering subsidiary acquired a slightly shaky outfit called Frictionfree Bearings in Idaho Falls. The plant's been lying idle for months but I hear there's been some unusual activity there in the last day or two—or should I say the last night or two?"

"You mean . . .?"

"I can't be positive, Will."

"But you think my wife is there!"

Gwynne shrugged. "We'll soon know for sure—I'm going down there right now. I thought you'd like to have a progress report."

"I'm going with you," Carewe announced.

Gwynne hesitated, his large-jawed face clouded with doubt. "I wouldn't be too happy about that. It might be a little dangerous—and I'm the one who's getting paid to take the risks."

"Forget it," Carewe snapped. "Just tell me where you are and I'll be right there."

A few minutes later, just as he was leaving the house, the communicator chimed again. He turned back impatiently, half-expecting to see Gwynne, but the topaz light which presaged an intercontinental non-visual message was winking. When he accepted the call a printed message appeared at the projection focus. The dateline showed it was from the Unation's base near Nouvelle Anvers, and the message read:



KATRINA

FURTHER EXAMINATION OF THE FLOATER WHICH SANK HAS REVEALED TRACES OF GORDONITE ON THE HEIGHT SENSOR LINKAGE. I OWE YOU AN APOLOGY. THE MATTER WILL NOW BE INVESTIGATED FULLY. BE CAREFUL. DEWEY STORCH.

Carewe nodded with satisfaction and made a photocopy of the message to show to Gwynne and Barenboim. Later, as he was hurtling towards Three Springs, it occurred to him that it was a little crazy for a glass figurine to feel pleased at having discovered definite proof that somebody was trying to smash him in pieces.

CHAPTER THIRTEEN

"YOU KNOW the best way to embarrass somebody?" Gwynne turned sideways in the front seat of his bullet. Behind his head the lights of an isolated Idaho community, dimmed by the plastic wall of the tubeway, streamed past like an irregular burst of tracer.

"No." Carewe would have preferred to remain quiet and think about Athene, but when borne along by the pneumatic peristalsis of the tubeway there was not even the task of steering to occupy Gwynne.

"You do what I'm doing now."

"Which is?" Carewe examined the little man's face, which stared back at him intently.

"Don't you notice it?"

"You mean you're staring at me?"

"Not at *you*," Gwynne moved his face a little closer. "I'm staring at your mouth. If you want to embarrass somebody, stare at his mouth while he's talking."

"Thanks." Carewe said heavily. "I'm sure that information will be of increasing value to me as I progress through life."

"Think nothing of it—my brain's full of stuff like that. One of the advantages of being well-read."

Carewe frowned. People kept mentioning literature to him and, as far as he could remember, all or most of them were cools. Was that how they passed their time? He settled back in his seat and tried to relax but the immediate future was filled with unsettling obscurity, and he found himself driven to talk to Gwynne.

"You really do read books?" he asked reluctantly.

"Of course, Willy boy. Don't you?"

"No. I watch Osman on tridi sometime," Carewe said defensively.

"That upstart!" Gwynne sneered.

"Didn't he once say that to lead was to be blind to the necessity of following?"

"I don't know."

"He did," Gwynne assured him. "As a philosopher that man is just pitiful. Take Bradley now . . ."

"Perhaps," Carewe put in quickly, "you could tell me who or what Beau Geste was."

Gwynne shook his head. "I don't read much fiction. I think he was an upper crust Englishman who got mixed up in a family scandal and ran away to join a tough military outfit in the desert. Probably the old French Foreign Legion."

Carewe nodded—that tied in with Kendy's comment on his arrival in Africa. "What sort of stuff do you read?"

"Anything, nearly. History, biography, science . . ."

Carewe thought of old Costello's words. "But how much do you actually remember?"

"Ah!" Gwynne said significantly. "That isn't the point. When you've read a book on any subject, even if you subsequently forget every word, you're left with a different kind of ignorance."

"How's that?"

"It isn't too easy to explain—I'd say it's because you're aware of how much you don't know."

Carewe lapsed into silence. Was that sufficient *raison d'être* for an immortal—increasing his awareness of his own ignorance, creating a negative image of knowledge? Could it be equated with a growth of wisdom? Or was Gwynne's different kind of ignorance, also subject to the erasures of time? Bunny Costello had the sad disappointed face of a man who had seen a lot of life, but failed to benefit from the experience.

The bullet decelerated gently, passed through a series of sphincters and slid into the breech of the Idaho Falls terminal. There was a minimal delay while a robo-loader set the vehicle on a chassis, and as soon as the drive transmission had engaged Gwynne headed south. Traffic was light and they made good time to the outskirts of the old city where factory buildings loomed along desolate streets. Blue-green lighting washed over featureless walls and bled into the sky, screening

the stars. Carewe felt a stirring of almost pleasurable excitement—the taste of danger was still too new and foreign to be palatable, but it would satisfy the ennui which had been growing in him all day. And he might see Athene again, within a matter of minutes. He took a deep breath, suddenly detected a harshly acid tang of perspiration and glanced at Gwynne. The investigator's forehead was dewed with sweat as he brought the bullet to a standstill in a short cul-de-sac. Carewe vaguely associated the unfamiliar smell as being associated with nervous stress, and he was both surprised and concerned.

"How're you feeling, Theodore?" he said casually.

"*Comme ci, comme ça*, mostly *comme ça*—this is routine stuff in my line of business." Gwynne touched his beaded forehead. "I must get the heater in this thing adjusted. Are you ready to go?"

Carewe nodded. "Is this the place?"

"We're close to it. Best go the rest of the way on foot." Gwynne opened a compartment and took out a small flashlight. It seemed to Carewe that the smell in the vehicle grew even stronger. He opened the bullet's door quickly and got out, snatching the cool night air into his lungs.

"I think the Frictionfree place is along here." Gwynne pointed down the cul-de-sac to where the street lighting faded into darkness.

Carewe was unable to see any signs; to his eyes the buildings all looked anonymous. "You know this area?"

"I got the location from a map." Gwynne crossed the street and walked

cautiously towards the black trapezium of a doorway, with Carewe close behind him feeling strange and selfconscious. He had an abrupt and utter conviction that there was nobody in the silent factory building, and that he had been tricked into taking part in a ridiculous game. He was about to voice his doubts when a snarling gray shape emerged from the doorway and sprang directly at them. Gwynne leaped to one side, pointing his flashlight defensively, then swore as he realised they had disturbed a cat. Carewe stared thoughtfully after the fleeing animal. The part of his mind which jealously guarded his safety night and day was telling him there was something wrong somewhere.

"Ever see one of these things?" Gwynne opened his pouch and held out a slim cylinder which appeared to taper off into a door key. There was just enough light in the street for Carewe to see that the teeth of the key were moving restlessly, like the stubby feet of a caterpillar. He shook his head abstractedly, his conscious mind searching for the cause of its subconscious unease. Gwynne slid the key-like artifact into the lock of a small door which formed part of the main gate. The door opened at once, releasing a gust of stale warm air, Gwynne motioned for Carewe to pass through into the utter blackness beyond.

Carewe hesitated. "This seems a hell of a place to bring someone you want to study. How good is your information, Theo?"

"Very good. Remember we're going in the back way—through shops and

stores. The office section at the front is bound to be more habitable."

"But the whole place feels so dead."

"Scared of the dark, Willy boy?"

Gwynne carefully switched on his flashlight, pushed it through the doorway and went inside. Carewe followed, studying the little man by stray reflections his spotlight drew from the metal sides of what appeared to be storage bins. On arriving at the factory Gwynne had suddenly become nervous—so nervous that the cat outside had terrified him for an instant. Carewe paused in mid-stride. During his moment of panic Gwynne had pointed his flashlight at the cat, instinctively and defensively, as though he was handling a weapon. When he was switching the flash on he had done so carefully—with the sort of respect one gives a weapon. And now he was walking with a crab-like gait which would have appeared natural for a man carrying a pistol, but which seemed odd for a person holding a flashlight.

Carewe stood still and let the other man draw away from him a little. Was he becoming paranoid in his thinking? There was no doubt that somebody had tried to kill him while he was in Africa, but if Gwynne joined in on the game it could only mean . . .

"Where are you, Willy?" Gwynne turned and shone his light back the way he had come.

"Right here," Carewe said, as his eyes dazzled painfully. The pressure of light left his face. He looked down and saw the spot of white brilliance trembling on his chest. *I'm a fool*, he thought, but he leapt aside

anyway—just as a spear of ruby-colored energy blazed from Gwynne's hand.

Shocked and blinded, Carewe kept moving at top speed with his arms raised to protect his face. He collided with a column, fell to his knees and his hands touched metal steps. Groping for a handrail, he ran silently upwards, guessing he would arrive on the catwalk which he had noticed spanning the storage bins. At the top he threw himself flat and lay blinking furiously in the darkness while caricatured after-images slowly faded from his vision. When his eyes had recovered he found the building was in darkness again except for a strangely localized red glow close to ground level. As he watched the glow deepened to a cherry color, then faded away, and he realised it had been coming from a piece of machinery which had been struck by Gwynne's laser burst. The thought of what would have happened to him had he not jumped aside in time brought a tingle of perspiration to his brow.

A spot of white light appeared below, danced briefly across metal walls and vanished. Carewe lay still, assessing his chances. Gwynne had the only weapon and it was a highly potent one, but to aim it efficiently he had first to throw a spot of incoherent light on his target. In doing that he was forced to advertise his position, but it was a very minor disadvantage. Had Carewe been the one with the laser he would be feeling relatively at ease. The light flickered again, in a different direction, and he pressed his face closer to the checkered metal of the catwalk.

As the seconds dragged past Carewe

was forced to an inescapable conclusion. If he continued to lie motionless and wait to be found—he would die before the night was over. Several times, he rejected the idea of trying to attack Gwynne, but always it returned with a slow insistence which seemed almost more menacing than the laser itself. Finally he raised his face from the metal and discovered he could see a faint pattern of skylights in the roof above him. Testing his vision, he scanned his surroundings. There was a faint greenish radiance from the overhead transparencies—refracted from the street lighting outside—which had not been noticeable until his eyes had adapted to the conditions. Gradually he picked up the confused outline of machines and storage bins, dimly laced together with the fainter traces of catwalks, handrails, beams and snaking pipes. Was there anything in the bins which might be used as a weapon?

Carewe waited until another tentative flash of light came from below. It was closer this time, but he used the splintered reflections to peer into the bin which yawned only a few inches from his side. It appeared to be about two metres deep and was about half filled with what looked like glistening fist-sized bubbles. Even when the illumination from Gwynne's flash had faded, Carewe could see the bubbles glinting like faint stars. He stared down at them in momentary bafflement, then a phrase from his earlier conversation with Gwynne filtered up into his consciousness. "... outfit called *Frictionfree Bearings*." Bearings! The bubbles

below him were actually spheres of solid metal.

Filled with a sudden defiant hopefulness, he moved closer to the edge of the bin. A ballbearing the size of an orange could make a respectable weapon. He gripped a handrail standard with his left hand and reached down into the bin, stretching with his right until he touched the cool spheres. His fingers closed around one but it instantly slid out of his grasp. He tried again, taking a firmer grip, and the bearing shot away just as before. It struck others with a loud multiple click and, immediately, the flashlight probed up from below, limning the handrail above him with frosty light.

Carewe realised he had made an appalling mistake.

The bearings he had been planning to use as weapons were not simple spheres of steel. Conventional bearings had been ousted decades earlier by the modern type whose surfaces—composed of radially polarized molecules—had virtually no index of friction. Unless they were laterally restrained any attempt to put pressure on one of them resulted in the ball shooting away like a squeezed pip. For many engineering applications they were superb, but basically unsuited for use as hand-held missiles. And there was nothing else available.

Holding his breath, Carewe slid his fingers under another bearing, hooked them to form a shallow basket and brought it upwards. He was forced to shift his weight as his hand came level with his face and the massive bearing darted away like a live thing straining to rejoin its fellows. It clattered into the

bin and the ruby sword of the laser slashed through the handrail, showering Carewe's back with droplets of white-hot metal. He clenched his teeth and tried again. This time he brought the bearing up in one continuous movement, just as Gwynne appeared at the head of the steps. Carewe swung the bearing sideways, moaning with despair as it evaded his grip and bounded along the catwalk.

Taken by surprise, Gwynne pointed his light at the bearing as it rushed towards him seemingly gathering speed. Carewe launched himself after it. The flashlight shone blindingly in his face for an instant, then he thudded into Gwynne. He tried to bear the little investigator down, but Gwynne fought back with desperate strength and they caroomed from rail to rail down the length of the catwalk. Carewe was whimpering with panic, aware that Gwynne still had the flash in his hand. He felt his opponent strive to turn the weapon against him and every muscle in his body exploded with undirected energy.

Gwynne and he went high over the railings, and downwards into one of the storage bins. For a moment Carewe thought he had plunged into cold water, then he realized he was in a bin full of very small bearings. Completely inimical to friction, the tiny metal spheres offered less support than water, and he went to the bottom immediately. The bearings invaded his mouth like ferocious insects. He could feel them clicking eagerly against his teeth and pouring down into his stomach, metallic lemmings driven by gravity to seek the lowest level of any

container in which they found themselves. They were indifferent to the fact that the containers now presented to them were Carewe's lungs and stomach.

Closing his mouth, he forced himself to stand up straight and his face emerged into air. He spewed bearings from his lips, but his mouth was barely above the surface and a fresh wave of them lapped over his lower jaw, filling his mouth with their steely swarming presence. Any attempt to spit them out would merely have resulted in another influx. He swallowed convulsively and, breathing through closed teeth, made his way to the side of the bin. There was a handrail standard close by. He caught it gratefully, dragged himself up onto the catwalk and lay vomiting. It was not until the last of the metallic spawn had been driven from his stomach that he remembered Gwynne. The investigator was a head smaller than Carewe, and would not have been able to get his face above the surface. Carewe looked down into the bin, but its contents were motionless.

Either Gwynne had . . . he sought for a word . . . *drowned*, or he was still alive on the bottom. The thought of deliberately putting his head under the silver 'liquid' filled Carewe with dread, but it was possible that Gwynne could survive for quite a long time on air filtering through the bearings, and to leave him there would have been unthinkable. He was sliding his legs over the side of the bin when a transformation took place in the bin. The flat silvery surface glowed with a beautiful crimson light which came from within. It was as if the millions of

steel balls had been transmuted to garnets and illuminated by a momentary blaze of sunlight.

The light died abruptly and Carewe froze in the act of lowering himself into the bin. Gwynne must have triggered off his laser. An accident? In the center of the bin another glow appeared, but this one was localized and its color was that of incandescent metal. Carewe felt the heat on his face, then his nostrils caught the smell of searing steel—and of something else.

He crawled away, choking, and reached the narrow stair which led to the ground. At the bottom he became aware that his hose and shoes had bearings in them, making walking a painful exercise. He sat down, removed his shoes and spilled the steel balls from them, listening abstractedly as they scuttled away to freedom down imperceptible gradients in the factory floor. *Gwynne was dead!* Instead of the million tomorrows, which Osman claimed was every man's natural birthright, he had nothing, *was* nothing. He was no longer a man, an investigator, an enemy. He no longer existed. The pain and bafflement of an immortal confronted with mortality made Carewe's breathing difficult. He shook his head, swearing bitterly into the impassive darkness, then with determined practicality began to cleanse himself of the remaining bearings. It was necessary to strip off all his clothes and turn them inside out. While he worked he found further steel balls under his tongue and lodged in the back of his nose. He snorted and spat, then noticed a peculiar sensation in his eyes. When he pressed the

surrounding skin other bearings oozed from the sockets and slid down his cheeks.

Ten minutes had passed before he had dressed again and found his way to the door where he and Gwynne had entered the plant. He went to Gwynne's bullet, remembered he had no ignition key and walked on through the sterile streets, trying to remember the route by which he had come. The events of the night had left his brain numb, but some conclusions were inescapable.

The information about Athene having been traced to Idaho Falls had been a fabrication, an elaborate ruse to get him out of the Three Springs area and make him 'vanish'. Gwynne had been Barenboim's man—which suggested that the president of Farma, having given Carewe a new kind of immortality, had then instigated a series of attempts on his life. *But why?* What possible reason could . . . ?

A fresh thought occurred to Carewe, pushing the analysis of Barenboim's motives into the back of his mind. If Barenboim wanted him killed, then the whole story about the machinations of a rival drug concern was also untrue—and that meant Athene could easily be dead.

It also meant that if she was still alive, Barenboim was the man who knew where.

CHAPTER FOURTEEN

THE POLICE STATION was in

complete darkness.

Carewe, whose sketchy knowledge of police operations came from occasional tridi programs, was taken by surprise. He knew that crime was comparatively rare in the wealthy and well-adjusted bitch society—but it had not occurred to him that policemen worked normal office hours. His feet burned from the hour-long search which had brought him to the station, and his chest was hurting. A suspicion that some of the bearings had found their way into his lungs kept nagging at him, but he did his best to forget the prospects of further surgery. There would be time to worry about that later.

He went up the steps into the station's shadowy entrance and pounded on the door. His fists made discouragingly little sound on the reinforced plastic. He was turning away in disgust when he noticed a communicator screen in one corner of the porch. Beneath it was a local code and the legend: CALL THIS NUMBER IN THE EVENT OF AN AFTER-HOURS EMERGENCY. Feeling scarcely mollified, he punched in the number and waited for the screen to energize. It flashed colors for a second, then a flat image of a heavy-eyed man in police grays appeared.

"What's the trouble?" the policeman asked sleepily.

Carewe hesitated, wondering where to start. "My wife has been kidnapped and one of the men who did it has been killed."

"Really?" The policeman sounded unimpressed. "I should advise you that the commset you're facing

automatically records retinal patterns and we make a practice of tracing and prosecuting hoaxters."

"Do I look like a hoaxter?"

The office eyed Carewe noncommittally. "Where and when was all this supposed to happen?"

"Listen," Carewe said angrily, "I'm reporting a serious crime and I don't propose to stand all night in this lousy porch while doing it."

"Can't do much for you unless we get some details, friend."

"All right. The kidnapping took place three days ago up north in Three Springs. The man died tonight right here in Idaho Falls, at the Frictionfree Bearings plant."

The policeman's eyes widened abruptly. "You were in the Frictionfree place tonight?"

"Yes, but . . ."

"What's your name?"

"Will Carewe. Do you mind telling me what's so special about . . ."

"Stay right where you are until an officer reaches you, Mr. Carewe. Remember we have your retinal patterns." The commset blanked out leaving Carewe feeling bewildered. He sat down on the uppermost step and stared down the lonely, unfamiliar street. The radio-activated tattoo watch on his wrist told him that, incredibly, the time was only a little past two in the morning.

He was opening his pouch to look for a cigarette when the sound of a helicopter reached his ears. Half-expecting it to herald the arrival of the police, he got to his feet and peered into the sky, but the machine was too large to be a personnel carrier. It

churned across the city at low altitude, its rotors punishing the night air, shaking the ground. Blue lights flashed along the length of its fuselage, chilling Carewe with sudden premonition. He looked south, back the way he had come on foot, and saw a shifting red glow on the horizon. The helicopter was a firefighting machine—and he had a glum certainty about where it was going. Gwynne's personally created inferno must have burned through the storage bin and allowed red hot bearings to scatter through the plant. Or—another possibility—the little investigator had preset an incendiary device with the intention of destroying the evidence of the murder.

Carewe was still staring at the bloody smudge in the south when a police car whispered to a halt beside him. A tall, thinly-built funkier in his mid-forties got out. His face was long and sallow, with dark eyes which scowled at Carewe over an incongruously red nose.

"Prefect McKelvey," he growled, loping up the steps to open the station door. "Is your name Carewe?"

"Yes. This all started with the disappearance of . . ."

"Don't say anything yet." McKelvey went inside, switching on lights, and entered a ground-floor office. He sat at a desk and motioned Carewe into a chair opposite. "I hereby notify you that this conversation is being recorded."

"That's good." Carewe looked around vainly for a microphone or camera. "There are plenty of things I want to go on record with."

McKelvey's face grew longer. "Let's

get started then—you admit having been in the Frictionfree Bearings plant tonight?"

"Yes, but . . ."

"When did you get there and when did you leave?"

"I left about an hour ago, say one-fifteen, and I was there about twenty minutes—but that's not the point. I'm here to report the abduction of my wife."

"And I am investigating a case of suspected arson," McKelvey countered.

"That's tough," Carewe said firmly, "because I'm not going to discuss trivialities like that fire till you take some action about my wife."

McKelvey sighed and examined each of his fingernails in turn. "You keep talking about your wife," he said reluctantly. "Does that mean . . .?"

"A one-to-one marriage." Carewe saw the prefect's eyes take in his beardless chin, but he had discovered it was no longer important to him whether people thought he was a cool or functional. "And she didn't walk out because I'm an immortal—somebody took her."

"Any idea why?"

"Yes." Carewe took a deep breath and thought, *I hope this costs Barenboim a billion.* "The firm I work for has developed a new kind of biostat, one which leaves the male function unimpaired."

"What?"

"The name of the drug is Farma E.80, and I was the first man to try it out." Carewe decided to censor some of the more painful details about his break with Athene and the deceptions

he had fostered. "My wife has since become pregnant—and this makes her an object of considerable interest to certain parties."

"Just a minute." McKelvey had become animated. "Do you know what you're saying?"

"I believe so."

McKelvey opened a drawer in his desk and looked at something inside it for a moment. "You were telling the truth," he said wonderingly. His eyes were filled with a kind of greedy reverence. "Go ahead, Mr. Carewe."

Carewe told the whole story, dealing with the attempts on his life in Africa, the confirmatory message from Storch, Barenboim's introduction of Gwynne, and the events leading up to the investigator's death. The prefect kept glancing at the device concealed in his desk and nodding his head.

"It's a fascinating story," he said when Carewe had run out of breath. "You were peeking a bit here and there on the polygraph, but I guess you're emotionally snarled up in the thing, so it's my opinion you were telling the truth all the way through."

"Thanks. What are you going to do now?"

"Only trouble is—your story doesn't hang together. Why should this Barenboim want to kill you or abduct your wife?"

"How should I know why?" Carewe was indignant. "Can't you proceed on the facts? It's obvious that Barenboim tried to have me murdered."

"Not all that obvious. Barenboim might have employed Gwynne in good faith."

"But . . ."

"There's a lot of money tied up in this thing. A lot of power. Somebody else could have got at Gwynne." McKelvey stroked the bristles on his chin, rasping them audibly in the quietness of the office.

"In the name of Christ," Carewe said bitterly. "Now I see why Barenboim told me not to bother going to the police."

McKelvey shrugged. "We'll have to get hold of Gwynne's remains. That will establish a death, and if there's anything left of the laser it will help show felonious intent."

"How long will that take?"

"From what I've heard about the extent of the fire—a day or two."

"A day or two! What about my wife?"

McKelvey reached for his computer terminal. "Please try to see this from my viewpoint. The only evidence you have pointing to your wife's abduction is an unsupported statement from her grandmother to the effect that she was supposed to have received a faked call from you. I'm going to put a tracer on your wife and if it hasn't produced any results by, say, tomorrow night, *then* we'll have something to go on."

"I can't wait that long—I could be dead tomorrow night." Carewe stated flatly. "Or do you not accept that somebody's trying to kill me?"

McKelvey made an unsuccessful attempt to look like a patient man. "Mr. Carewe—I personally accept that somebody is gunning for you, but as a prefect of the police I can act only on formal evidence. Give me a chance to get some, will you?" He activated the terminal and told it to produce dossiers

on Gwynne, Barenboim and the Farma Corporation. When he had finished he went to a wall dispenser and came back with two vapouring cups of cofftea.

"Thanks," Carewe said ungraciously. He sipped the hot liquid.

The prefect grinned confidentially. "While we're waiting—is this new biostat the real thing? I mean . . ."

"I know what you mean. I'm still able, but I'll be damned if I'll give you any formal evidence."

"That won't be necessary." McKelvey laughed nervously. "You know, I almost tied off last year. Just think . . ." The computer terminal chimed and spat out a compcard. McKelvey put it into a reader. "This is our file on the Farma Corporation." He studied it for a moment, manipulating the controls, and his brow gradually knotted in a frown.

"Something wrong?" Carewe prompted.

"Don't know. You didn't say anything about that outfit you work for being short of cash."

"That's impossible. I'm in accounting and I should know."

"It's down here," McKelvey said doggedly. "According to the file, Farma's profits have been slipping for three years and this year there's a projected trading loss of over eight million newdollars."

"You're interpreting wrongly," Carewe assured him. "Give me the reader."

The prefect looked doubtful. "Information obtained from the computer over-ride network is confidential to the police—but you've done me a personal favour coming

here." He stared at Carewe warily and passed the instrument to him. Carewe held it to his eyes and a sense of unreality crept over him as he realized the prefect had made no mistake.

The molecular level of the compcard he was examining gave a concise analysis of Farma's financial structure, division by division. Carewe's own section, the biopoieses division, and one other looked as though they might barely break even in the current year; but the others were heading for disaster. He was going swiftly down the debit columns, trying to grasp the overall picture of Farma's finances, when one item arrested his gaze. *Capital expenditure, maintenance and plant depreciation, Drumheller Laboratory—N\$1,650,000.00.* He checked back and discovered a smaller capital expenditure charged to the same item in the previous year, but nothing at all in the year before that. There was no mention of the Drumheller Laboratory anywhere in the credit columns. He spun the controls, burrowing deeper into the secrets locked in the card's coded molecules, but McKelvey snatched the reader from his hands.

"That's enough," the prefect snapped. "What were you going after?"

"Nothing—I get fascinated by figures." He decided to keep to himself the information that Barenboim had poured more than two million newdollars into a laboratory which, apparently, had never earned one cent to justify its upkeep. That was significant enough, considering all the circumstances, but the real snapper lav

in the fact that the very existence of a Drumheller Laboratory had been kept secret from even the most informed Farma employees. Carewe had a coldly exultant certainty that he now knew where the development work on E.80 had been carried out.

And that meant he also knew where he could find Athene.

CHAPTER FIFTEEN

IT WAS DAWN when Carewe finally left the police station. Obeying McKelvey's instructions, he took a public bullet direct to Three Springs, then went shopping. Aware that the prefect was likely to have a computer trace on him, he bought some items of food using his credisk. As soon as he had established that he was back in his home community he got down to the serious part of his shopping, the part for which it was necessary to use cash.

Firearms had not been on sale to the public in the North American continent for well over a century—the bitch society had no use for them—but he was not prepared to tackle Barenboim's Drumheller stronghold without some kind of weapon. He walked aimlessly around several stores before noticing one which specialized in camping equipment, where he bought a traditionally styled woodsman's knife, a lightweight axe and a satchel. Carrying his purchases selfconsciously, he took a taxi out to his dhorne, again paying by credit to demonstrate to McKelvey that he was

properly domiciled.

The dhome was exactly as he had left it, filled with depressing silence, and there were no recorded messages for him on the commset. He ate a light meal, then put the knife and axe into the satchel. As an afterthought he added several candy bars and his binoculars. It was still mid-morning and Drumheller was only two hours drive to the north, across the former Canadian border, so there was time to satisfy his craving for sleep. He lay down on a couch and forced himself to relax, wondering if he was being too optimistic in thinking he would lose consciousness when his mind was so crammed with . . .

He was awakened by the brilliance of late afternoon sunlight on his face. Shivering slightly, he went to the commset and used its directory bank to get a code for the Drumheller civic services block. When he had recorded the number to speak to the monitor of the industrial rating office. After a few seconds the head of a plump young funkier appeared at the set's projection focus.

"I'm Will Carewe, costing monitor for the Farma Corporation," he said crisply. "What is your name, please?"

"Spinetti." The young man looked annoyed at Carewe's tone.

"Well, I've got some bad news for you, Mr. Spinetti. One of the machines you are supposed to be monitoring has sent us a completely ridiculous rating estimate on our Drumheller property. My employer is losing patience with this sort of thing, and he has instructed me to . . ."

"Just a minute," Spinetti cut in, his

face darkening, "why don't you get your facts straight before you start sounding off? I happen to be very familiar with my programs, and I know that Farma has no property in this area."

"Must I spell out every detail?" Carewe sighed tiredly. "My employer is Mr. Hy Barenboim. Does that mean anything to you?"

"Oh!" Spinetti's eyes shuttled in concern. "The chemicals laboratory out at Kilo 12."

"Kilo 13, I think."

"Kilo 12 on Radial Three," Spinetti gritted. "Do you want to come up here and measure it yourself?"

"Don't let this happen again," Carewe said, and broke the connection, hoping he had not upset Spinetti's digestion too much. He picked up his satchel, went out to his parked bullet and drove northwards.

A cloud-torn sun was nearing the horizon when Carewe reached Drumheller and, counting the kilometres, swung out from the city center along Radial Three. Now that he was faced with it, the prospect of breaking into a laboratory which was almost certain to be guarded was more daunting than he had anticipated. His earlier conviction that he had located Athene was beginning to fade rapidly, and had almost vanished when he stopped the bullet on the darkening roadway. The tenuous fingers of the city had been left behind minutes earlier—Kilo 12 had only two buildings set like movie sets against its vista of sere grasslands. One was obviously a warehouse, and the other a long multi-

levelled structure perched on a low rise. A narrow compressed-earth track ran up from the road to a gate in the metal wall which surrounded the building. Carewe watched for signs of activity but the laboratory—glinting redly in the setting sun—could have been an encampment left by a long-departed civilization.

He drove further along the road until out of sight from a possible observer on the top of the rise and switched off the bullet's engine. Ignoring the inquisitive faces which stared at him from passing cars, he slumped down in the seat and waited for the sky to darken behind its lattice of coral-pink condensation trails. The air was cool when he set off up the slope, and breezes searched his body with random, invisible fingers. Coming into view of the laboratory he was reassured to see light streaming from the upper windows, but at the same time became aware of how little cover there was on the approaches. All he could do was hope that Barenboim was not sufficiently security-conscious to have set up heat sensors or infrared scanners.

The feeling of helpless exposure increased until he was in the lee of the perimeter wall which proved to be over three metres high. Close examination showed it to be seamless alloy construction, without even a rivet head to offer a foothold. Carewe made an experimental leap to satisfy himself he could not reach the top with his fingers, then walked along the base of the barrier, passing around the rear of the lot and finally drawing near the entrance gate. The wall was featureless

and unclimbable the whole way, and the gate—which was closed—appeared equally unpromising. He glared helplessly across the quiet prairie to where the lights of Drumheller shone line scattered embers. Will Carewe, amateur commando, had been thwarted at the first simple obstacle, a construction of sheet alloy which he could probably have cut with a domestic can opener . . .

Seized with inspiration, he took the axe from his satchel and went to the side of the wall furthest from the road. Close to the corner he swung the axe and it sank cleanly into the pale gray metal with surprisingly little sound. A wait of five minutes produced no sign of alarm within the enclosure, so he returned to the wall and attacked it with cautious economical blows. In a few minutes he had cut a metre-high tongue in the shape of a inverted V which he was able to bend downwards to the ground. There was a cavity wide enough to contain the wall's uprights, and beyond it another sheet of alloy. The inner skin gave him more trouble because he was unable to make clean swings at it, but—working carefully and with frequent long waits—he succeeded in cutting another tongue. Pushing its apex inwards a short distance, he looked through at a dimly lit expanse of concrete bounded at its far edge by a wall of the laboratory building itself. Apparently he had not attracted any attention.

He tucked the heavy knife into the waist band of his hose and, retaining the axe in his hand, pushed through the wall. The triangular piece of alloy easily bent upwards again to make the

opening less noticeable. Carewe was pushing it into place when a sudden glare of light threw his shadow across the wall. He spun, raising the axe, and glimpsed the headlights of a car which must have come through the front entrance. The brilliance of its lights, reflected and channelled down the narrow strip between the laboratory and the outer wall, seemed to fill the entire universe. There was no way, Carewe thought, for the driver to miss seeing him—but the vehicle continued on its curving path and moved out of sight beyond the far end of the building.

Did that mean he had escaped detection? Or that the driver had been quick witted enough to pretend he had noticed nothing? Carewe slid the axe into the top of his hose at the back and ran to the nearest wall of the laboratory. He gripped a downpipe and scaled it, using instinctive skills nurtured by fear. The flat roof overhung the wall and as he was pulling himself round the projection the axe slid to one side and dropped. It rang loudly on the concrete below. Carewe pressed himself to the roof, then realised the low section he was on was overlooked by windows of the laboratory's upper storey. He scuttled across the roof and crouched in a corner, his head just below the level of the window sills. Five, ten minutes went by before he began to accept that his presence still had not been discovered. Experiencing a return of the optimism which had prompted him to embark on the mission, he took stock of his surroundings.

From the elevated position he could

see over the wall to the prairie, which faded away to the north in impassive gray-glimmering folds—no menace from that direction. Of the row of windows above his head, one was lit. He crawled until he was underneath it, got to his feet and risked a slanting glimpse inside. The room within was small and its only furniture appeared to be one chair and a folding bed upon which a black-haired woman was lying. Her back was to the window, but Carewe recognized the langerous upthrust of hip immediately—with his eyes, with his mind, with every molecule of his body.

Athene!

He tapped the window instinctively and froze, belatedly wondering if there was anyone else in an unseen corner of the room. Athene lifted her head slightly and relaxed again. Carewe waited several heart-pounding seconds and tapped more loudly, watching Athene's reaction. She raised her head, sat up and turned in his direction. White coronas of shock flared around her eyes, then she was at the window, her hands pressed to the glass. Her lips moved silently and a heady exultation filled Carewe—once he had his wife out of the room they could be through the perimeter wall and out on the open grasslands in a matter of seconds.

He slipped his knife out, reversed it and drove the haft against the glass. It connected with an unnervingly loud report which jarred his wrist, but the tough glass remained intact. He tried again, and this time the knife almost flew from his numbed fingers. Athene covered her mouth with trembling fingers and her gaze flickered towards

the door of the room. Dismayed by the resilient strength of the glass, Carewe put the knife away and had reached for his axe before remembering it had fallen to the ground. He gestured vaguely to Athene, ran to the edge of the roof and swung his legs over. His feet were unable to find the downpipe, but there was no time to be cautious. He pushed himself off into space, threshing for balance, and landed heavily already groping for the axe. The pipe he had climbed was less than a metre away, but the axe was nowhere to be seen. Cursing its perversity, he began to search a wider area.

"It's over here, Willy" The voice was cool and amused, as only that of a two-centuries-old immortal could be.

Carewe lurched to his feet, breathing hoarsely, and forced his eyes to a reluctant focus.

The portly, highly-fashionable figure of Hy Barenboim looked incongruous against the bleak surround of the perimeter wall. His eyes watched intently from their bony lairs, and his right hand held a flashlight in a way that left no doubt it was a weapon.

"Hy," Carewe said. "I had a feeling you'd show up."

"Then it was mutual, dear boy." Barenboim gestured with his flash. "Let's go inside."

"Just a minute—I hurt myself when I made that drop." Carewe winced and slid his hand inside his tunic. It came to rest on the handle of the knife.

"You should have known better than to attempt such undignified heroics," Barenboim drawled. "Now move."

"Why not kill me here? Or is it too public?" Carewe eased the knife

upwards till it lay in his hand.

"The exact location of your demise is a small matter," Barenboim said coldly. He switched on his flash and directed the spot at Carewe's face.

"*My eyes*," Carewe whimpered. He twisted his head away from the light and in the same movement brought the knife out from under his tunic. Barenboim gasped as Carewe, taking the single chance open to him, hurled the heavy knife with all his adrenal-boosted strength. It hit Barenboim square in the throat—handle first—and he fell back against the wall, still holding the flashlight. Carewe closed in before the laser sword could be turned in his direction. He caught Barenboim's right wrist, forcing the flash away, and drove his fist into the ballooning stomach, once, twice, three times . . .

Carewe came to his senses when he discovered he was having to hold Barenboim up to keep hitting him. He let the other man fall and stood back, suddenly realizing he had done his best to kill Barenboim. His reaction on seeing the knife strike the wrong way had been one of savage disappointment and anger. He felt vaguely that his sense of shock should have been greater, but his taste for introspection seemed to have vanished somewhere on the long road to Nouvelle Anvers, Idaho Falls and Drumheller.

Kneeling beside the unconscious man, he picked up the dual-purpose flashlight, then opened Barenboim's pouch and took out all the keys he could find. He ran down the narrow strip of concrete to the front of the

laboratory. A roadcar, the one in which Barenboim must have arrived, was parked in the forecourt and the gates were now lying open. Carewe ran to the laboratory door and found it locked—which suggested the building was empty except for Athene. He tried several keys until he got the door open. The lobby beyond was empty, but he hesitated—he had merely assumed Barenboim had no lieutenants inside.

Carewe examined the flashlight, which was still lit. Moving the slide backwards extinguished, and pushing it forward restored the light. He pointed the flash at the ground and edged the slide further forward. There was a springy resistance then the concrete surface exploded into sputtering lava. He hefted the flashlight respectfully and ran on into the laboratory block, no longer worried about meeting opposition. There were staircases on both sides, but the one on the right seemed most likely to lead him to Athene. He sprinted up it and along a corridor which stretched the length of the building. At the far end he found a shorter transverse corridor with six doors in its outermost wall. Estimating the position of Athene's room, he tried a door. It was locked, but he could sense her presence within.

"Athene," he called.

"Will!" Her voice was faint. "Oh, Will—is it really you?"

"You bet," he shouted. The fourth key he tried opened the door and—with no perceptible lapse of time—she was in his arms. "Easy, easy, easy," he whispered, trying to damp out the trembling of her body with the strength he had discovered in his own.

"Will." Abruptly she pushed him to arm's length. "You've got to get away from here. You don't know what those two are really like." Her eyes hunted over his face and his throat constricted when he saw the left eyelid was almost closed, a familiar signal of stress.

"That's the whole idea, hon. Lets go." He took her hand and they ran. Carewe felt as though carried along by a powerful wind; he could scarcely feel his feet touching the floor. They sped down the stairs through the door and out into the night air. "We'll take Barenboim's roadcar," he snapped.

They tumbled into it and slammed the door. Carewe experienced a moment of panic as he tried key after key in the ignition lock, but at last he found one which fitted. The turbine spun up instantly. Without waiting to switch on the lights, he slewed the car across the forecourt in a wallowing turn and fired it through the open gateway like a rocket. Something large moved in the darkness beyond the gate. He had a split-second to realise it was another car coming in, then there was a rending impact. Carewe felt his own vehicle climb skywards for an instant and he had a crazy hope he was going to drive right over the streamlined contours of the other car. Athene screamed as the universe tilted sideways, and her voice was lost in the bomb-burst of the car smashing into the hillside.

The impact balloons, exploding out of the dashboard under the force of their gas bottles, saved Carewe's life. But as he sat trapped by their insistent pressure—and looked up at the pink, triumphant face of Manny Pleeth—he

found himself wishing he had died.

CHAPTER SIXTEEN

"BEFORE they come out of there," Barenboim said, breathing heavily and still clutching his stomach, "get me my flash. Our young friend took it before he made his dash."

Pleeth nodded and worked his hands between the plastic skins of the impact balloons. He groped around on the vehicle's front shelf for a moment and withdrew the flashlight, the thin line of his mouth curving tightly with pleasure.

"That's better—I hadn't realized guinea pigs could be so dangerous." Barenboim took the flash. "Would this mess have been noticed down on the road?"

Pleeth shook his head. "Shouldn't think so. We both had our lights off."

"That's something in our favour." Barenboim walked round his own car, inspecting it critically. Carewe felt Athene stir beside him in response to Barenboim's changing position, like iron filings disturbed by a magnet. He tried to reach her hand.

"The steering gear is gone," Barenboim said, halting beside Pleeth. "Can you find a line somewhere and tow my car inside the gate?"

"Should be some in the store."

"Right! You take care of that while I escort our guests back inside." Barenboim touched a relief valve at the side of the car and gas hissed out of the balloons, causing their skins to wrinkle and pop. As soon as he could move, Carewe climbed out of the vehicle and helped Athene to come through the

same door. The one at her side was too badly crumpled to open. Barenboim, standing well clear of Carewe and with his flashlight at the ready, pointed towards the lab. Carewe shrugged, put his arm around Athene's shoulders and began to walk. Inside the lobby he headed for the right hand stair.

"Not that way—we're going down to the basement," Barenboim indicated a door below the staircase. Carewe opened it and ushered Athene down a single flight of steps to a large basement which was fitted out as a high-temperature laboratory. The centre was occupied by what he tentatively, identified as an electron furnace. It was ringed by tele-microscopes, servo hands and heat shield projectors.

"Will," Athene whispered, "you shouldn't have come here. He's going to kill us."

Carewe tried vainly to think of a reassuring lie. "It looks that way," he said sadly.

"But I thought you of all people would have been . . . aren't you afraid, Will?"

"Scared stiff would be a better way to put it." Carewe wished he could explain something to her about his discovery that living in fear, as he had always done, was a little like being already dead—but he had an idea it would sound ridiculous. And, being Athene, perhaps she already understood.

"Athene," he said desperately, "I let you down . . ."

"Don't, Will, *don't*." Her eyes became lenses of tears as she pressed her hand over his lips.

"This is too much," Barenboim commented in a bored voice. "Spare me the reconciliation scene, please."

"Hy," Carewe said slowly, "I'm very sorry I wasn't good enough to split you open when I threw that knife. But in a way it doesn't matter much. You see, you don't really exist—so there was no need for me to kill you." He watched Barenboim's eyes as he spoke, and derived a spare satisfaction from the realization that—for the very first time—he had made contact with the other's glacial mind. During their entire previous relationship, he now understood, Barenboim had been using him with exactly the same detachment as he would have had in cutting a laboratory animal to shreds to further an experiment. Suddenly he felt almost as old as Barenboim.

Barenboim's womanly lips twitched once, then stretched into a smile. "Good stuff, Willy," he said. "Very deep."

Keeping the flash trained on Carewe, he went to a wall-mounted control panel and threw a series of switches. Eight electron guns ringing the furnace began to glow with pinkish light, which dimmed slightly as the heat shield projectors set up their floor-to-ceiling barriers. The force fields they created were vastly intensified versions of the tenuous screens used in weather control, designed to contain the hellish sun-like environment which was being created at the heart of the furnace. Exhaust grilles mounted in the ceiling directly above the furnace carried the excess heat away to an exchanger system for use warming the rest of the building.

"You're too late," Carewe said, as Athene buried her face in his shoulder, "I've already been to the police—I told them everything I know about you."

"Which isn't very much." Barenboim adjusted a vernier.

"They know you tried to have me murdered in Africa and at Idaho Falls."

"Correction, Willy. They know *somebody* tried to murder you—but with Gwynne conveniently out of the way there is no provable connection. And what possible motive could I have had?"

"Money," Carewe said. "They know that the Farma Corporation is headed for a spectacular bust."

Barenboim's face clouded for an instant. "I think, Willy, that I was guilty of an error of judgement when I selected you. I don't know how you managed to defeat Gwynne, and all along you've shown an unexpected tenacity—but you still can't explain how disposing of you would solve any financial problems I might have."

"I was hoping you would tell me that."

"I daresay you were." Barenboim's joviality had returned as he made a final adjustment on the control panel and moved away from it. "I believe it's customary on tridi thrillers for the villain to make a full explanation at this stage, but—just to show you how inhuman I am—I don't think I'll play the game. How's that for a touch of vindictiveness?"

"Not bad," Carewe conceded, shifting his weight slightly. Barenboim's reactions had been a little slow in their earlier encounter, and his

only hope lay in making an unexpected lunge for the flash. "But I wonder what inspired it. You're proud of being inhuman, so it must have been . . . ah . . . my reference to your incompetence in business?"

"Incompetence!" Barenboim sounded genuinely angry.

"What else would you call it?" Carewe disengaged himself slightly from Athene. "When a man with two centuries of experience allows a viable concern like Farma to go bust . . ."

"Farma!" Barenboim snapped. "Farma is a triviality, Willy. Within the next few hours I, *personally*, will earn myself one billion newdollars—do you call that incompetence?"

"I . . ." The strain of maintaining an artificial conversation brought sweat out on Carewe's forehead. Moving as casually as possible he stepped away from Athene. "I don't see . . ."

"Of course, you don't. You didn't even see that E.80—the miracle biostat you fired into your thick skin—was all a hoax. You didn't see that I was setting you up, Willy. You and your wife."

"Setting us up?" Carewe glanced at Athene, whose face was almost luminescent in its pallor. "But . . ."

"I invented the E.80 story, Willy. And I didn't keep it a secret, as you imagined. I leaked just enough information to a Eurasian group to convince them . . ."

"To hell with that," Carewe snarled, a sense of premonition pounding inside his skull. "What did you do to me and Athene?"

Barenboim regained his self-control and smiled frostily. "Of course, Willy, I'd forgotten that your peculiar

emotional fixation would unbalance your view of the operation."

Carewe took one step towards him, heedless of the laser. "What about me and Athene?"

"You were guinea pigs, man. And to demonstrate the efficacy of E.80, you had to produce a litter. Your shot of E.80 was nothing but plain water—your wife's was something entirely different."

"Such as?"

"Didn't you notice anything out of the ordinary in her behavior after that shot?"

Carewe thought back to the three days at Lake Orkney—Athene had burned with a white heat which no normal system could have sustained. "You mean . . ."

"It was rather an expensive aphrodisiac, Willy, but it was necessary to drive your wife into an early pregnancy." Barenboim smiled again. "And surely there must have been considerable fringe benefits for you."

Carewe turned to his wife. "Athene, I . . ." His voice faltered.

"It's all right, Will."

He faced Barenboim again and walked forward on rigid legs. "You'd better kill me now," he whispered. "Otherwise . . ."

Barenboim shrugged and leveled the flashlight. His thumb pushed the slide forward.

"Hold it," a voice called from the stair. "What are you doing, Hy?" Manny Pleeth leaned over the handrail, his pink-stained eyes triangulated on Barenboim's face.

"What does it look like?"

"It looks like murder—and I never

agreed to that." Pleeth descended the remaining steps and advanced across the laboratory, his cigar-like gold ornament swinging at his chest. Carewe's mind, locked in an icy stasis, picked out an incongruous detail of the scene—Athene was backing away from Pleeth, the man who was arguing for her life.

"Come now, Manny," Barenboim spoke tiredly. "I thought you were a realist."

"No killing!"

"Manny—in a few hours from now you and I are going to receive one billion newdollars." Barenboim kept the flash centered on Carewe's chest. "In exchange for that one billion newdollars we are going to hand over a formula which is worth precisely nothing. When our clients discover the truth they are going to be angry. Have I made it simple enough for you thus far?"

"I never agreed to murder."

Barenboim continued speaking with elaborate, insulting precision. "Anticipating our clients' anger, and their subsequent and very natural desire for revenge, you and I have arranged to disappear. To do that successfully we need a lead of several days. How far do you think we'd get in today's world with our friends shouting their heads off?"

"We could tie them up and drug them."

"True, but somebody else could untie and undrug them—did you know Willy has already been to the police?"

Pleeth's plastic-smooth face turned towards Carewe. "But why?"

"Because your partner," Carewe

stressed the word, "has been trying for days to have me killed. You're in pretty deep, Manny."

"Perfectly correct," Barenboim said briskly. "Even Willy realizes it's too late for you to indulge in scruples. Now . . ."

Athene, who had backed in the direction of the stair, gave a tremulous sob, and Barenboim swung the flash in her direction. Carewe sprang forward, but he was too slow—Pleeth cut in before him and stood directly between the laser and Athene.

"All right," Pleeth said quickly. "I agree that Carewe has to be silenced but not the woman. Let's . . . let's take her with us."

"What has happened to you, Manny?"

"But *she's pregnant!*" The words seemed to tear Pleeth's throat.

"So what?" Barenboim's forehead crinkled slightly. "You aren't the father."

"I . . ." Pleeth's throat worked convulsively, and his lipless mouth curved upwards in a parody of a smile. "I am the father, Hy. You wouldn't deny me a child."

"Have you gone crazy?"

"No, Hy, no." Pleeth cupped his gold cigar in both hands and held it out to Barenboim. "I was twenty, Hy. Twenty years old and I'd never had a woman. It was my mother, you see—she brought me up to believe that sex was dirty . . . the diseases . . ." Pleeth took a quavering breath. "She, my mother, I mean—she didn't like to be called *she*—came into my bedroom and caught me one afternoon. She, my mother, called it self-

defilement . . . she had a hypo gun, I don't know how, and she shot me . . . made me kneel down in front of her . . . and she shot me . . ."

"Don't come near me," Barenboim said in a faint voice.

"I was only twenty years old," Pleeth crooned, his eyes fixed on his gold cigar, "but I fooled her, my mother . . . I had two days left to collect my own semen . . . Being a chemistry student, I was able to preserve it in a bacteriostat . . . then I designed this phallus to keep it in . . . and she, my mother, never guessed . . ."

"You're ill," Barenboim whispered strickenly.

"Not I." Pleeth smiled as he revealed his secret triumph. "I'm still functional, Hy—not like you . . . I still wear the badge of manhood. And I've had other women, even without using aphrodisias, sometimes . . . but none of them ever became pregnant. When I knew that Athene's shot contained both an aphrodisiac and a fertility factor—well, what red-blooded man could resist an opportunity like that? The pink curvatures of Pleeth's face tightened as he grinned at Barenboim.

"You went to her house!" Barenboim's face had become ashen. "You risked a billion-dollar operation—for this!" He snatched the gold cigar from Pleeth's hands and, with a stiff-armed swing which snapped the fine supporting chain, hurled it towards the furnace. Its glittering trajectory took it through the heat shields and into the shimmering pink hell beyond. There was the

briefest flare of light and the cigar was gone.

"Mother," Pleeth shrieked. "I'll kill you."

He threw himself at Barenboim. The two men were locked together for a second, then the laser stabbed a smoking hole through Pleeth's body. He went down immediately. Carewe felt himself moving as though in a dream—the very air had become a clear, clinging syrup. He launched himself over Pleeth's crackling corpse, just as the laser was turning in his direction, and clubbed Barenboim with a fist that seemed to be made of lead. Barenboim crumpled, and Carewe prised the laser from his fingers. He shone its aiming spot into Barenboim's eyes, watched the pupils shrink like receding black universes, and eased the slide forward.

"Will!" Athene's voice came from far away. "No!"

Carewe paused, and won his way back to sanity. "I too," he told Barenboim as he stood up, "am not like you."

He walked across the laboratory to Athene, who had sunk onto the stairs, and sat down beside her. "You should have told me about Pleeth."

"I couldn't have told anybody about that night." She caught his hand and pressed her lips against it. "I didn't know what had happened to me. I felt so dirty, Will—I had to drive you away from me."

"But I would have understood, worked it out some way."

Athene smiled sadly, her left eyelid quivering. "Would you, Will? I didn't believe you when you tried to tell me

about the new drug . . . What made us think we were so special that our marriage could be immortal too?"

"We weren't ready," he assured her. "But we are now."

CHAPTER SEVENTEEN

ATHERE HAD BEEN prepared to allow him a year, but he had settled for two months. It was high summer and the waters of Lake Orkney visible from the hotel room, were sunfire and amethysts.

Carewe took the hypodermic gun from his travelling case and set it beside the small pile of books he had brought to read during the vacation. The books were of the traditional printed type, not because they were experiencing a vogue, but because they conveyed a greater sense of history and continuity. He was learning to think of his own allotment of time as being an inseparable thread of all time, of himself as part of the forces of history and entropy. Reading was still not something he particularly enjoyed, and he had doubts about how well the occupation would sustain him down the years—but he had come to respect books themselves. The first immortals . . .

"I'm going for a swim—while I'm still presentable," Athene said, examining her naked body in a mirrored wall. Her figure had filled out in the past two months, but only Carewe could detect the first swelling behind which lay the growing embryo,

the baby they had decided to keep.

"You look wonderful," he said.

"Don't bother with a swimsuit."

"Oh, Will, do you think . . .?" She turned, saw the hypodermic and the pleased smile faded from her face. "Now?"

"Yes." He nodded peacefully.

"Do you want me to stay with you?" Athene came towards him.

"No—I'd like you to go on down to the beach and soak up some of that expensive sunshine. I'll be right down." She opened her mouth to argue, and he said, "Don't you trust me?"

Athene closed her eyes, and they kissed. She tied a flimsy robe around herself and, without looking at him again, left the room. Where she had been, dust motes wheeled and countermarched in a shaft of sunlight. Carewe picked up the hypodermic and sat for a moment, his left hand resting on the books. Perhaps if he read enough he too would be able to write someday, some year. If he ever did put stylus to paper he would like to set down a philosophy for immortals.

The great mistake is to be greedy, to try to hold on to all of one's past and all of one's future. An immortal must learn to accept that endless life is also endless death—of the successive personalities who inhabit his flesh and are gradually changed and worn away by the passage of time, by the shifting tides of events. But, most important of all, immortality is also the endless birth of new personalities. An immortal must acknowledge—easily and gracefully—that he as he exists at any one point in time, will die just as surely

(CONTINUED ON PAGE 110)

The SUN DOOM

by STANTON A. COBLENTZ

FAMOUS AMAZING CLASSIC

Professor Kraft's theory was sensational. It could only be a theory. But this mad dictator demanded that it become a fact!



JOHANN EMANUEL KRAFT, the world-famous astro-physicist, stood peering out into the darkness through the three-inch slit of his cell. His long gray beard was ragged and dirty; his hands, with their filth-encrusted fingers, were weazened and claw-like; his grimy tatters of clothes, seamed and fissured in a hundred places, were all that was left of the sleek suit in which he had come to the Concentration Camp thirteen months before.

With a sigh, he settled down on his straw pallet in the dimness just beyond the door; and wondered for the thousandth time what nasty trick of fate had thrown him behind the bars. His interests had been wholly with the celestial bodies; he had cared nothing for politics; and even the rise to power of that most evil of rulers, Narlith, the "bloody Chancellor," had not seemed to affect him, although it had filled the land with fire and terror. And then one day a company of the dictator's Gray Troopers had called for him; and he had been brought here without trial, without explanation, and without the ability to communicate with his wife and three little ones.

Thoughtfully the prisoner rubbed

one scarred hand over a cheek disfigured with new-made wounds. It was not so much for his own sake that he rued his captivity as for Elsa and her priceless three. And for his work also he mourned—had he not made discoveries that would have been world-shaking, revolutionary? As time on time before, he clenched his fists and swore a bitter oath that, if ever the chance came, he would make Narlith pay dearly for his crimes. But, of course, the chance never would come, for who ever returned from the steel portals of Gratznau?

"Prisoner 1198, this way!"

He was startled by the snapping command of the jailor; startled still more when the heavy door clanged open and he beheld two guards looming in the thick twilight of the corridor.

Cold fear crept over him. Often, from adjoining cells, he had heard protesting inmates dragged. He had listened to their cries gradually choked and fading out as they were jostled away; then, after a matter of minutes, he had heard shots ringing out from the courtyard. Constantly, in his own thoughts, he had steeled himself for just such a summons; but, now that it had come, he found himself still un-

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prepared.

"This way! Quick, you hound! We haven't all day to waste on vermin!"

A heavy boot assisted him along the corridor.

But after all, he asked himself, should he not be glad of the turn of events? One swift merciful shot—was it not to be preferred to the unending foulness of the cell?

And so, though his heart fluttered wildly, he did his best to check the trembling of his legs. A minute later, they had come out into the sunlight—a November sunlight so bright that he reeled and had to shade his eyes; for not in more than a year had he known anything but shadows.

From beneath his almost closed lids, he could not see the expected firing squad; nor did he at first observe the airplane that lay in waiting in the vast courtyard. He had been shoved through the doorway before he became aware of its existence; and, once within, he felt blindfolding hands reaching around his head. Then he heard swift orders snapped out; and, after an interval, listened to the droning of motors, and felt the plane jerking along the field and into the air.

FOR a long while, it seemed — actually, for over three hours — the flight continued. He would have been astonished could he have gazed below, and seen the armies deploying with great ugly columns of tanks, and the blackened countrysides with their smoking pyres where great cities had been. But, fortunately, he was spared all knowledge of this, while occupying himself by wondering futilely, what was happening to him? Was he being borne to a fate worse than death? Or, on the other hand, could it be that he was being rescued, and that Narlith had been overthrown? But no! For, in that

case, would he have been cuffed and blindfolded?

It was with relief that he finally felt the plane being jolted to rest. Then, when the bandages had been removed from his eyes and he had gradually adjusted himself to the light, he found that he was in a mountain valley, beneath towering snow-peaks. All about him, surrounding the landing field, rose the dark spires of a pine forest—a forest into which he was borne by automobile along a winding slushy road.

A few minutes later, they halted before the ancient timbered walls of a nobleman's hunting lodge; and were hurried inside this castle-like edifice. In the huge central room, before the blazing fire that shed an uncanny illumination across walls adorned with antlers and wolf-heads, Kraft was to receive the surprise of his life.

Among the half dozen hard-faced, grim-looking men who stood about the fireplace, there was one whom he recognized only too well. True, he had never seen the man before; but had any mortal's features ever been photographed so often as that small, spiteful, acidulated countenance, with the comic-opera flat black hair and wispy moustache, and the dull eyes that now and then took fire with a mad-dog glitter?

The great astro-physicist sagged beneath the impact of that shock. He stood face to face with his chief enemy, Ferdinand Narlith, the Supreme Juke of the powerful nation of Elmania!

A SHARP poke in the ribs, from one of the guards, brought him to a realization of the proprieties of the situation. "Say, Hail Narlith!" the attendant whispered into his ear.

"Hail, Narlith!" the victim repeated, feebly.

The Juke glared at him. Kraft no-

ticed that his face was much more lined than in the photographs; that there were blue hollows beneath his eyes. "I have the honor of addressing Johann Emanuel Kraft?" he rumbled.

"That is my name." But the prisoner could not bring to his lips the terms of respect which, he knew, courtesy demanded.

"Say, Excellency!" prompted the guard.

"Excellency!" mumbled Kraft, weakly.

But Narlith was evidently preoccupied—so much so that he did not appear to notice a rudeness that, under other circumstances, might have cost the offender his neck.

"I understand, sir," went on the ruler, while tapping nervously at his chest, "that you are the author of the so-called thermomolecular solar hypothesis?"

The scientist stared at the dictator, in a daze. Among Narlith's many pursuits, interest in astro-physical theories had never played a prominent part!

"I believe you once wrote the following," declared the Juke, snapping up a printed sheet handed him by an attendant. And he read:

"There is reason to suppose that the internal equilibrium of the sun is maintained by a very exact balance of forces. On the one hand, the terrific pressure of gravity tends to draw the globe's entire content downward and inward. On the other hand, the tendency of atoms to disintegrate and fly apart, under extreme conditions of heat and chemical activity, counteracts the effect of gravity. The possibilities are explosive. In fact, we see the same potentialities constantly in the flaring up of *novae* or new stars, probably representing suns that have blown up.

"If the solar gravity were relaxed by even a small fraction of one per cent,

or if the force of the dissociating atoms were accelerated in the slightest appreciable degree, the age-old balance of our own sun would be destroyed, and the long-pinioned energies would vomit forth in such an eruption that life on all the planets, including the earth, would almost instantly be annihilated."

In unrelieved amazement, Kraft heard these words which he had contributed to a scientific journal shortly before his incarceration.

"Do you still believe these statements?" demanded Narlith.

"I see no reason not to."

The sovereign read on:

"Moreover, it would be possible, by earthly means, to upset the ancient equilibrium. I myself have invented a ray—named the Austra-beam, after a scientific colleague—which accelerates the process of atomic disintegration even at the sun's distance of ninety-three million miles. Applied consistently and strongly enough, this ray would possibly—indeed, I would say, positively—upset the old coordination of forces, and cause an atomic upheaval accompanied by such blasts of heat that life throughout the Solar System would become impossible."

The Juke paused. "Those are also your words?"

"I cannot deny them. But, if you will pardon me, I fail to understand—"

"You still believe in this theory?"

"It is more than a theory."

Narlith chuckled. His face, in the glow of the fire, had taken on an almost fiendish expression. Near him his attendants remained statue-still, their features grim, almost saturnine. "Perhaps you know, sir, your views were the reason we had to—well, lock you up for your own protection?"

KRAFT had always suspected that Narlith was crazy. But now he

knew.

"Yes, for your own protection," continued the Juke, "and in order to make sure that our enemies would not capture your secret."

"But my God, sir," broke out the scientist, even though he knew how foolish it was to argue with a lunatic, "what under heaven do you suppose our enemies would do with my secret?"

Again the dictator chuckled — chuckled slyly, evilly, with a slimy smirk. "Naturally, they would do just as I will."

"I simply don't follow you."

"Did you not say you could cause the sun to erupt and destroy all life on earth?"

"I did. But, of course—" Kraft paused, and stared at his master, dumbfounded. An idea so wild, so monstrous, so diabolical had come into his head that he reeled, and almost fell. But as he stared into the maniacally gleaming eyes of the Juke, he received confirmation of his worst surmises.

"Let me explain," went on Narlith. "Not that I usually explain anything to anybody—folks should be guided by their intuitions, the way I am. But you may be able to work better if you understand all. I have a most important duty for you to perform, Mr. Professor!"

Kraft did not like the slurring accent with which the dictator referred to his former occupation. But still less did he like the wild-beast glitter in the ruler's eyes.

"Doubtless you know nothing of war developments during the last year?"

"How should I know? Prison walls have no tongues."

"Then you haven't heard how those bullies and traitors of Muskovians counter-attacked and drove us out after we won half their country? It was against all the rules. Worst of all, they

and their murderous allies the Anglams have invaded our land, without any provocation except that we tried to invade them first. They don't appreciate the rights of the Master-Race. In fact, they have so little sense of fair play that they have surrounded and wiped out our best armies—the inhuman devils! Our brave boys still resist, but it can't last much longer. Those foul-hearted fiends have laid siege to our Capital. When they conquer it, they will attempt to spy out my hiding-place, and to capture me—me, the Juke, the world's most eminent leader!"

DURING this recital, Kraft had tried his best to appear distressed, but he could not quite keep back his exaltation that at last the dictator was meeting his match.

The Juke had begun to rage excitedly about the room. "But they will never take me alive!" he hissed, his lips curling like an enraged dog's. "Never! If I have to die, they will die with me! Yes, they and the whole world! The forests will go up in cinders! The very continents will crack and melt! Nothing will be left—nothing but flame, flame, flame! No one will ever live to say the proud head of the Juke has been humbled!"

His voice had risen to a scream; his hands waved and shook like a barnstorming actor's in a scene of high melodrama.

"That is why I have called on you—to help me, Mr. Professor! I have fitted up a laboratory where you may work! You must make all speed—such speed as no man ever used before! You must throw forth your ray, and blow up the sun—the sun, and the whole earth with it! We will all die together in one glorious conflagration! Then, and and then only, will the Juke be avenged!"

The ruler threw back his head, and

laughed—laughed long and horribly. Meanwhile, in Kraft's appalled mind, a rapid decision was forming. Sooner than perform the unthinkable deed that Narlith asked, he would endure any torture, any suffering.

"How long will it take you?" demanded the Juke, in a bellow.

"I am sorry. I have to refuse."

Terrible to see was the wrath of the ruler. He stormed about the room in a tantrum; foam gathered on his lips; his arms shook uncontrollably; and, for an instant, he seemed on the point of grasping Kraft by the neck and trying to throttle him.

But almost as swiftly as the tempest arose, it died down. Narlith became composed again, with a composure that was almost more fearful than his rage.

"Very well," he acknowledged, with a faint rumbling in his voice and a glare in his eyes, "you are a free man. Every man in Elmania is free. Make your own choice. We will send you back to Gratznau to think it over. When your body has been beaten by rubber clubs and steel rods, and stung by drugs worse than serpents' bites, possibly you will change your mind."

A guard had stepped forward and clapped heavy hands upon the victim's shoulders. The rattle of handcuffs startled the air.

But Kraft merely smiled grimly. He had known what was coming, and was ready to face it.

"One thing more!" snarled Narlith. In the quietness of his manner there was something so insinuatingly unpleasant that the prisoner trembled, knowing that his enemy's trump card was yet to be played.

"I understand, Mr. Professor, that you have a wife. Also two young sons and a daughter. I suppose you would like them to remain alive and well?"

The victim felt something within him

crumbling. He staggered, and leaned against an oaken bench for support.

"I take it that they would not enjoy the fire-and-sulphur cure?"

Too well Kraft knew what this meant. He had heard the fire-and-sulphur cure mentioned in horrified whispers as the most ingenious and terrible torture ever invented—something that no human body and mind could survive.

Beneath his own anguish, Kraft felt sure, he would not crack. But that his Elsa, his little Pauline, his tiny Fred and Carl should be racked by such barbarities—what father with a heart in his breast could endure the thought? It seemed to him that it was not his own voice but some stunned being outside of himself that spoke as, tottering deliriously down upon the bench, he heard the words, "I—I—only spare them, and I will do all you ask!"

CLAD in the new work suit that had replaced his prison rags, Kraft was busy in the laboratory adjoining the hunting lodge.

Great masses of electrical equipment lay heaped about him. Motors buzzed; little wheels clicked and clattered. Varicolored lenses gleamed on a table at his side, amid cylinders like enlarged radio tubes. But the central apparatus was a black contrivance shaped like a great telescope; more than a score of feet long by a yard in width, it shot upward through a slit in the ceiling. At its lower end was a concentration of wires connecting with a clockwork device, a little beneath an eyepiece like that of a telescope.

The scientist sighed as he worked; and the sweat rolled down his brow. All his movements were slow and deliberate, those of a man to whom time is nothing. There were long rest periods between each two actions; and had it not been for the guards, one of whom

now and then poked a bayonet provokingly in his direction, those rest periods would have been even longer.

After a time, the door swung open. An armed escort thundered through; then, saluting, made way for the glowering figure of Narlith.

Even as he entered, it was evident that he was in a black mood. He glared accusingly at Kraft. "What progress today?" he screeched almost before he was in the room.

"I am working with all speed, Excellency," stated the prisoner, who, with an effort, had schooled himself to use the customary term of address. "But there are technical difficulties—"

"Technical difficulties? By my boot-strap, you cannot put me off with lies! Here it is more than a month already, and we are getting nowhere!"

"Just a few days more, Excellency!"

"A few days more? Are you crazy? We have not all the time in creation!"

The Juke's nostrils expanded like those of an enraged bull. His eyes shot out twisted gleams that accentuated his appearance of madness. A froth came to his lips, and drooled down his chin.

"By Thor! Do you not understand?" he shouted, banging his fist repeatedly upon the table, until several of the lenses were jarred off and clattered in fragments to the floor. "Those curs—the Muskovians and Anglams, they are already in the Capital! The lice look for me everywhere! If they find my hiding-place—"

Narlith paused, and made an eloquent slashing gesture with one hand.

"We have not a day to lose! No, not an hour if we are to carry out our plans before too late!"

Kraft shrank to the further side of the table, and leaned against the great black tube for support. He was both encouraged and terrified. That the Muskovians and Anglams were in the

Capital—that was the best news in many a day! Yet what could be more appalling than that Narlith had escaped their clutches? Now it would be impossible for Kraft to carry on his policy of deliberate small delays, by which thus far he had put off the execution of the Juke's terrible scheme.

"I give you one more day!" shrieked the ruler, shaking with emotion. "Just one more day! Mark this well! If you cannot succeed in that time, by my helmet! I will take no further chance of waiting to be captured by those villainous Anglams. I will seek refuge elsewhere, and it will be the fire-and-sulphur cure for you, my friend, and all your family—yes, and for your old father and mother, too! We will wipe out the tribe of you!"

"But, Excellency—"

"Silence! I take no back-talk! By tomorrow at this time, unless my intuitions fail me, you will have done what I ask!"

THE unfortunate man opened his mouth in a further attempt at protest. But the cold point of a bayonet warningly pricked the skin above his ribs.

"Yes, you will do what I ask!" rushed on the Juke, flinging back his head in a maniacal burst of laughter. "And then—brimstone and fire! The earth will make a beautiful torch! Observers on other stars will smile to watch it! 'How lovely!' they will say. If they are wise, they will know that it is I—I, Narlith, the earth's greatest leader, giving an exhibition for the cosmos as I bow my way off the stage!"

His laughter still rang out, louder and eerier than ever. Desperate, the victim thrust himself forward once more. "But, Excellency—"

This time the sabre-thrust was more than a prick. Groaning, Kraft fell back.

But in his ears dinned the words of the enemy:

"Twenty-four hours you have! It is enough! Work night and day, my friend! Night and day! After that, you will never have to work again!"

There came one last frenzied peal of laughter; then a steel door clattered to a close; and the tramping of many feet gradually died away.

STAUNCHING the flow of blood above his ribs, the stunned scientist turned back to the laboratory machinery. Only too well he knew that he could indeed accomplish Narlith's aim within twenty-four hours; that, in fact, he could have accomplished it already. Did the Juke, by some psychic intuition, realize this? Or was it that he had been driven frantic by his own despair? In any case, Kraft told himself, what was done to him would not matter in the long run; even what was done to those he loved would not matter—although he still could not bear to think of their coming to harm. Yet what man, however bitter the cost of refusal, had the right to destroy the earth? Oh, why had he been idiotic enough to reveal his discovery?

But there was no help for that now. Was there not, in any case, some way to trick the Juke—some way to pretend compliance with his demands? For several hours, while Kraft labored mechanically, his brow was wrinkled with thought. But it was long before the perplexity, the despair registered by his features gave place to a faint, grim smile.

Any watcher would have known, from his expression, that he was as a man clutching at a straw. But shortly after nightfall a quickening, an intensification of his efforts might have been noted. A continuous, vigorous whirring might have been heard from the wires

connecting with the great telescope-like tube. Sparks might have been seen flashing from the connections. And out-of-doors, where the muzzle of the tube projected above the roof like the snout of a huge howitzer, a vague crimson glow might have been observed. But that was all. There would have been nothing to show why his whole frame shook with nervous tenseness; why his lips quivered as he placed himself at the eyepiece of the instrument or examined the clockwork device; nor why his countenance, from time to time, still took on that faint, grim smile.

All through the night he worked. His manner was jerky, excited, hurried; he was continually making observations, continually adjusting the instruments. The guards, reporting to Narlith, bore the message, "He seems to be carrying out your orders, Excellency!"

Only at dawn did he cease his activities, and, throwing himself down upon a couch, try to snatch a few hours of sleep. . . . In this effort he was unsuccessful; long before noon he was up again, ranging impatiently about the room, and glancing continually at his watch, although Narlith was not due until afternoon. Why was it that, with eagerness in his bloodshot eyes, he would stare so often out of the window, down the forest road whitened with the snow that had just begun to fall? Why would he peer into the heavens, as if he expected their wide vacancies to open and a prodigy to spring forth? Why had he become so absent-minded that he did not notice the food an attendant had placed at his side?

The hours wore away . . . until exactly twenty-four had passed since the Juke's visit. Kraft once more consulted his watch; and, even as he did so, he uttered a muffled groan; and his thin, pale face, with its haunted expression, appeared even thinner and paler than

usual.

"Hail Narlith! Hail Narlith! His Excellency approaches!"

So silently had the party come that Kraft had not heard the crunching of automobile tires against the snowy sod. Now, automatically, he bowed; or, rather, it seemed to him that something within him crumbled, causing him to collapse to the floor.

Yet, for the last time, he glanced wistfully toward the window, with eyes that seemed to entreat for something fervently desired.

The door burst open. The Juke's personal guard stamped in with a martial thump, thump, thump. Then the pale face of Narlith himself appeared. He did not waste time on formalities. But, coming straight to the astro-physicist, he demanded:

"Well, my friend, have you done it?"

THE captive coughed, and cleared his throat. His lips were dry; his throat seemed about to crack. Somehow, all he could force out was an incoherent gurgling.

"Do you hear me?" snorted the Juke. "I want to know, have you done it?"

Another long silence. Then, in a voice that did not seem to be his own, Kraft dragged out the words:

"I am doing it, Excellency."

"Doing it? I want to know, is it done? Are you ready to annihilate the sun and earth?"

"Nearly ready, Excellency. There are still some minor tests to make. If you will give me time—two or three hours—perhaps even one—"

"By the blood of my enemies! Have I not already given you time enough? No, not another hour! Not another minute!"

"But, Excellency, it is necessary—"

"Nothing is necessary but what I order! I see it in your eyes, you filthy

coward and traitor, you are only playing for time! You *can* carry out my commands—and, by Thor, you must and will!"

Kraft bowed his head. But his teeth were gritted.

The dictator snapped out his watch. Turning to the Captain of the Guard, he said, "It is now five minutes before the hour. We will give him till the hand is on the hour. If then he has not made up his mind, you will order the fire-and-sulphur cure for his family. As for himself—the fire-and-sulphur cure is too merciful!"

The threatened man made no reply. But despairingly he lifted up his eyes, as if to plead with an unresponsive Providence. His lips moved faintly, as if in prayer. And the moments ticked by in silence.

Five minutes are not long, as the clock counts time. But to the sufferer, as on the one hand he pictured the world engulfed in flames, and, on the other, saw his loved ones writhing in agony, that brief period embraced tortured eternities. It seemed long afterwards when he heard the Juke's words, harsh and decisive ringing in his tortured thoughts.

"Time up!"

He wished to avoid his enemy's gaze, but that malevolently scowling face was turned upon him with a tigerish intensity.

"Well, what is your decision, Mr. Professor?"

"There is nothing to decide. I need more time."

"Seize him, men!"

The arms of the guards closed about him; he heard a rattling of steel, and felt the biting metal cut into his wrists; while rudely a bandage was forced over his eyes.

"Away with him, to the lower dungeons of Grulin!"

THE victim may have winced, as he heard mention of this most ill-famed of torture chambers, but he gave no hint of his feelings as the guards jerked and pushed him toward the door.

The portals swung open, and a breath of snow-laden air blew in. But why was it that the guards suddenly halted? Why did they stand stock-still, as if petrified? Why did little astonished gasps escape their lips? Why that sudden, sharp cry from Narlith?

In the tenseness of that moment, the prisoner felt himself unexpectedly released. And despite the fetters on his hands, he was able, by a jerking arm-motion, to knock the bandage off his eyes.

As he did so, he too let out a gasp. But it was a gasp not of terror, but of stunning, incredulous joy. Could he be dreaming, or was it true that he was staring at lines of helmeted men? Men who, ranged many layers deep, had been creeping up at the forest edge? Was that the actual gleam of bayonets in the blue-gray dusk of the woods? And did he see, waved on high above the assaulting ranks, the red and golden emblem of the Anglams?

Yes! It was real, it was not a dream! The helmeted ones had swept forward; shots had rung out; Narlith's guards, attempting to flee, had fallen beneath the surrounding columns. And the Juke himself, shouting oaths and curses and screeching like a wildcat, had been caught in two stout pairs of arms, and tied with ropes; after which he broke down, and wept like a woman. No mild St. Helena was in store for him!

"Who was it sent out the alarm?" demanded Colonel Edgemont, of the invaders, as he glanced inquiringly at Kraft. "Who flashed those messages to our astronomers?"

Then it was that, in exultation, the astro-physicist realized that his scheme

had worked—had worked far better than he had dared to expect. It had been merely on a wild hope that he had fastened the Austra-beam on a certain spot in the constellation of Cassiopeia, in which he knew that a periodic comet was due to appear, so making it certain that astronomical cameras would be photographing the region. He had thought it possible that the Austra-beam, though invisible to the human eye, could be picked up by the camera's sensitive lens, after the manner of many remote stars and nebulae. And so, aided by the clockwork mechanism, he had focused the beams all through the night on the chosen spot. He had woven them into the pattern of a gigantic "S. O. S." And he had shaped arrow-like beams, pointing down from those letters toward his prison.

"It took all day to find you," stated the Colonel, after Kraft had admitted sending out the alarm. "Astronomers in seven countries reported photographing the S. O. S. Their calculations indicated its point of origin within twenty miles. We guessed its military nature—and knew it was important. But no one suspected what a prize awaited us."

Narlith snarled like a captive wild-beast; while two soldiers bound his wrists with the handcuffs just removed from his intended victim.

"You will receive the International Gold Medal of Valor for the capture of World Enemy Number 1," the Colonel promised. "You will be renowned the world over—"

But Kraft scarcely heard him. He was rejoicing that Elsa and his dear ones need no longer fear the fire-and-sulphur cure. And he was glowing in the knowledge that science—the impractical science of astronomy!—had vanquished brute force and saved the earth from the most Satanic peril in all.

GREG BENFORD & DAVID BOOK:

The SCIENCE in



SCIENCE FICTION *

THE ROAD TO HAL

Most of our readers have seen the Kubrick-Clarke film *2001:—A Space Odyssey*. It is the only big-budget film that treats the subject of space travel, and one of the few films ever made that handles a science-fiction theme with respect. Critical reaction to the movie—from *Life* to the underground press—united in singling out one feature for special attention: the computer HAL.

HAL is the real star of the show. In a saga of human progress, HAL'S superhuman abilities stand out. These abilities would destroy the plausibility of a merely human hero, but HAL is a machine, transcendent (in our age) by right of origin. At the same time, HAL is like the hero of a Greek tragedy, doomed through a fatal flaw within himself.

But how plausible is HAL? Could a HAL be built? By 1992, as the movie

asserts? Part of the answer lies in an understanding of what present-day computers are doing. They have some very HALish abilities already. The rest depends on developments in their immediate offspring. Of the things HAL does in the movie (and in Clarke's novelization of it), which lie within technology's grasp during the next thirty years?

HAL 9000 stands for *Heuristically programmed ALgorithmic computer*, model 9000. Clarke postulates a technological breakthrough taking place in the 1980's, by means of which computers manufacture—or grow—their own neural networks automatically. Thus HAL built part of himself to the specifications of the *Discovery* mission. His first "instructor" was Dr. Chandra. Presumably HAL had other instructors, or programmers, and may have reached the stage where he could

supervise his own instruction. He has two "brothers"—two other 9000 computers which remain on earth when HAL himself ships out in *Discovery*. Unless they went through the same training program as did HAL, their self-generated neural networks would differ from his. But they have the same intellectual powers and are sufficiently like HAL that Mission Control is able to use them to backstop HAL.

"His prime task was to monitor the life-support systems," Clark says, "continually checking oxygen pressure, temperature, hull leakage, radiation, and all the other interlocking factors upon which the lives of the fragile human cargo depended. He could carry out the intricate navigational corrections, and execute the necessary flight maneuvers when it was time to change course. And he could watch over the hibernators, making any necessary adjustments to their environment and doling out the minute quantities of intravenous fluids that kept them alive."

Principal functions, maintenance of life-support systems and navigation. But HAL does much more. He handles television communications with Mission Control. He plays chess with his human shipmates, manages an electronic library and plays selections from the ship's music collection for them, and checks up on their physical and emotional well being.

More surprisingly, HAL talks. He has several output systems: visual display, hard (printed) copy, radio transmission. But the most convenient for human purposes is human speech. HAL's voice is a mellow baritone, his

accent General American. His speech is very even, slightly modulated so as to create an effect of continual reassurance. There is no other emotion apparent in his voice; when HAL develops his murderous malfunction this quality becomes eerie and sinister, the very opposite of reassuring. But HAL is not supposed to have emotions of his own. They would serve no purpose in his function.

Of course he understands spoken English, too; that is, he accepts voice input in ordinary language. His comprehension seems to be perfect. And he analyzes what his shipmates say to learn *their* emotional states.

HAL always knows which man is where—he never mistakes Frank for David or talks into an empty room. Apparently his input includes optical scans of each compartment in *Discovery*. Further, he has pattern recognition capabilities of a high order; not only can he tell one face from another, he can even read lips.

More important, HAL is innovative. He can respond to situations for which he has not been programmed. In fact, he is creative in a small way—if devising anti-personnel techniques on a spaceship count as creativity.

But one last characteristic puts all of these brilliant capabilities completely in the shade: HAL is schizophrenic. Torn between the need to conceal from Bowman and Poole the mission's real aim (for the sake of security) and his intended role of data processor, enemy of inaccuracy and untruths, HAL becomes neurotic. He starts to make mistakes. Finally, threatened with disconnection, he tries to protect himself by killing his crewmates. At

every step he rationalizes his action as the best way to fulfill the mission.

This part of the story has a tendency to make computer experts and tyros alike squirm. If secrecy is so important, why couldn't HAL have received careful instructions on how to maintain it? Why should such a simple problem boggle his supermind? Anyway, what real purpose is there in having Bowman and Poole conscious during the outward voyage? There's nothing for them to do that HAL can't do better if they're not around making him feel guilty. And if HAL is such a hotshot, why doesn't he use all the tricks at his disposal to wipe out Bowman, the only survivor of the crew? He could have jolted the ship with a sudden burst of thrust, knocking Bowman down. He could have doused the lights by which Bowman worked to disconnect him. And being smarter than any of us, he probably would have thought of plenty of other things.

But more to the point, how can a machine without emotions, free of the "lusts and passions of organic life," become neurotic? Human conflicts arise from the conflicting action of a multitude of drives, each developed to meet a specific problem of survival. These drives required ages of biological and cultural evolution under changing conditions. It is no wonder they often clash. There is no reason to believe that a computer built to perform within narrow constraints would behave like a human personality.

The organization of the human brain and that of a computer like HAL differ in several important ways. While these differences are not inherent in

computer design, they're going to be with us for at least the next few decades.

Readers who have never worked with computers are probably going to feel a little overwhelmed by all the terminology. We apologize for this. Computer engineers, systems designers and programmers have created a jargon almost as exotic as their machines. Some terms like "output" and "program" have edged their way into ordinary language; others are only vaguely familiar. We believe that in ten years or so the average citizen will be encountering computers and talking about them as familiarly as he now uses and discusses automobiles. Automobile technology is really just as complicated in its way as computer technology, but people have had enough time to get used to it. There won't be as much time to adjust to computers. Consequently, we hope any readers distracted by strange technical terms will regard them as a kind of cultural enrichment or, at worst, an evil necessity.

The classification of computers resembles the Linnaean classification of living organisms. There are two broad categories, analog and digital computers, corresponding crudely to the plant and animal kingdoms. (There are also hybrid computers which share traits of both classes, but we'll leave them out since they spoil the analogy.) HAL is a digital computer. He is the highly evolved descendant of the primitive abacus, the desk calculator and various species of IBM data processors.

Each type of machine is specialized to carry out a certain task. As technology improves, all computers

become more efficient at their tasks. Occasionally a sweeping innovation makes possible a whole new "phylum." Such an innovation was internal programming, invented by John Von Neumann around 1945. Programmed or automatic computers follow a preset series of instructions instead of having to be guided step by step.

It is important to understand what programming means. Even though the human programmer supplies the instruction, the machine does not lack scope for original or independent "thought." That is because the instructions are *contingent*: they say, "calculate such-and-such, and then, if the result is positive, do subprogram P; otherwise do subprogram N." Or they say, "Count the words in the following list and if there are more than 1024, stop." The programmer need not understand all the implications of his program, or know to what data it will be applied. All he has to do is make sure that the machine can follow it.

A digital computer manipulates numbers. Everything it does can be expressed as a series of numerical calculations. The numbers are expressed as pulses, usually electrical or magnetic, like telegraphic Morse Code. In their internal workings, digital computers use binary (base-two) or octal (base-eight) number systems most of the time, not the base-ten numbers we are familiar with. This is a consequence of their electronic design.

The brain is also electrical. It contains about ten billion neurons or nerve cells. When charged, a cell has a voltage of about 70 millivolts, about 1/20 the voltage of a "C" flashlight

battery. Thus it is natural to look for parallels in the action of computers and our brains. Neurons have much more elaborate structure than computer circuits, and they are far from completely understood. Still, some important differences are known, which we'll point out as we sketch some of the features of computer design.

Modern digital computers are made principally of transistors, diodes, resistors, various types of magnetic material, and wire. These correspond to the proteins that go to make up the cells of a living organism. A computer's "cells" are of two types, logic and memory.

The flip-flop, the high-speed electrical equivalent of a toggle-switch, is a typical logical element, or logic. In its simplest form it uses two transistors and two resistors. It can be set in either of two positions, which might be called "up" and "down". Each time a pulse arrives on the input leads, it reverses the setting, up changes to down, down changes to up. Binary numbers have only two digits, 0 and 1. The two settings of a flip-flop can be used to represent them, say, "down" for 0 and "up" for 1. One binary digit (the information content of one such cell) is called a bit. The bigger a number is, the more places are needed to record it. Ten binary places suffice for all the numbers from 0 to 1023, or 2^{10} minus 1; twenty suffice for all the numbers up to 1,048,575, or 2^{20} minus 1.

High-speed computers process bits in bunches—one bunch at a time. These bunches, called words, consist of a certain number of bits, typically 36 or 60. The word size determines the

largest number the computer can routinely work with. The larger the word size, the bigger the numbers that the computer can record and use in arithmetical operations.

Logical elements are the elementary building blocks of computer design. Many of them actually have simple logical functions, like "and" and "not." For example, an "and" gate has two sets of input leads. If both sets register zero, the output leads of the gate carry a 0; if either or both sets carry a 1, the output is a 1. The average logic has 5 to 10 circuit devices (transistors, diodes) in it. If the computer has only a few thousand logical "cells," like the IBM 7094, it still has to be wired for approximately 100,000 circuit components, not counting memory devices.

The usual high-speed memory is called magnetic core storage. A magnetic core consists of a network of fine crossed wires like a miniature chickenwire fence. At each crossing there is a tiny doughnut of magnetic material, looped around both of the intersecting wires. The doughnut can be magnetized "up" or "down," and so can store one bit of information. The location, or address, of that bit is determined by the two wires that cross there. The wires serve to enter a bit at the address by magnetizing the little doughnut, or to read information already in the address by sensing the direction of magnetization.

A human brain with no body is just a mass of spongy jello. In the same way, logic elements and memory by themselves are only a lot of expensive bits and pieces. To work, a computer must receive instructions and raw data

and report the results. It is under human control, if only to turn it on and off. It needs a power supply and plenty of air conditioning and several hours of preventive maintenance each week.

This means a lot of sophisticated engineering is necessary, all of it described by the term *hardware*. There's no way to do justice to it in a quick description. But just as all vertebrates share certain anatomical characteristics, all high-speed computers are organized along similar lines.

Every digital computer contains a control unit, one or more processing units, a memory, external storage, and input and output units. The control unit translates external instructions, usually in the form of a programming language like FORTRAN or ALGOL, into "machine language." Programming languages resemble spoken English to a limited extent, but machine languages are not really languages—they are directions for working with numbers.

The processors carry out logical and arithmetic functions. The memory stores data and instructions; it serves as a kind of blackboard, and its contents changes all the time in the course of a job. External storage is used for reference tables or to store information arising during the job. A typical storage system is magnetic tape. One reel of tape is 1200 or 2400 feet long and holds a few million bits of information.

The input unit brings data and information to the computer. Present-day computers receive most of their input from punched cards or magnetic tapes. A tape unit can read in data at about half a million bits per second.

The computer's output goes onto tape or spews out of a high-speed printer. High-speed printers turn out up to 500 lines (120 characters to the line) per second, which also comes to about half a million bits per second. At that rate a copy of *Amazing* would take about ten seconds to print.

A program is a series of instructions for processing bits. Each instruction is some kind of bit-shuffling process, plus a label which says *which* bits to shuffle. All of the several hundred elementary instructions fall into five categories: arithmetical (add, multiply, etc., a specified number and the number already in the temporary storage "accumulator"); input and output; shifting (for example, shift the number in the accumulator one place to the left); transfer of control (where to go to find the next instruction); and logical (compare the bits in corresponding positions of two specified words and alter the word in the accumulator accordingly). And that's *all* a computer can do.

Properly exploited, it's a lot. The reason lies in the machine's speed. The fastest computers now in operation are the CDC 7600 and IBM 360/195. The 7600 can carry out almost four million additions per second and can read bits into or out of an address in core storage at about the same rate. This translates into an "add time" of .28 microseconds and a storage "cycle time" of .3 microseconds. These two times are the measures of a computer's speed.

Because a computer can do its operations only one at a time, it needs a large memory for temporary storage.

Try it yourself. For example, when you balance your checkbook against a

monthly statement, you only write a few of the steps; the rest are in "temporary storage," in your head. If you were to write down all of them in order, you would see there are many more than the ones you're normally conscious of. Most of the operations of the human brain are quickly forgotten. Just as with a computer, the amount in the "accumulator" and in "core storage" at any time is minute compared with the total that has passed through.

The complexity of the problems a computer can handle is limited by its storage capacity. A typical CDC 7600 has a core storage holding 577,000 sixty-bit words. Of these, 65,000 are in what is called a *random access* memory, which means that information can be read into or out of any address directly. Human memories are not random accessed; we sometimes have things in our memories we can't quite recall until the right cue comes along, and then a whole file comes tumbling out. Magnetic tapes, of course, are not random accessed, either; to find something stored halfway through the tape, the tape unit has to scan everything along the way.

Summarizing, what are the differences between the brain and the best electronic computers of 1970?

In the first place, it is far from clear how the "hardware" of the brain is arranged. There are no precise analogs for processor, memory unit, control unit, etc. Nor is there a sharp division between different types of neural "circuitry." A neuron is partly logic, partly memory cell, partly communication link. In some sense, though, each neuron can hold one bit

of information, so the brain has something like 10^{10} bits of "core storage." By contrast, the CDC 7600 has 3.6×10^7 bits of core memory. Even though the computer weighs about ten tons, the brain is "larger." On the other hand, the machine's storage cycle time is .3 microseconds; the neural cycle time is about 1.5×10^{-2} seconds, fifty thousand times slower.

There is no analog in the brain for "word size" or "add time." Signals move through the computer at about one-third the speed of light, a million times faster than in the brain. The time required for a signal to travel across the brain is about a thousandth of a second. Loosely speaking, this is the time required to process one "instruction"—the shortest time scale on which the brain can do anything. In comparison, the CDC 7600 processes ten million instructions per second.

The maximum time needed for a computer to reach information at any address in external storage on a tape is a minute or two. A human is only a little slower; he requires about one to ten minutes to find information in a book in his own collection. Since each letter is the equivalent of about five bits (think of Morse Code), an average length book contains about three million bits of information. The Illiac 4, due to start running early in 1971, will have one billion bits of external (actually, "intermediate") storage—the equivalent of 300 or so books. So it's not hard for the human brain to have a larger external storage capacity than the largest computer.

Viewed as a computer, then, the brain is larger and slower than its competitor. But there are at least three

more differences, all just as important.

First, the logic and memory elements of a computer usually have just one or two sets of input and output leads. But in the brain, each neuron has more than 100 connections, called dendrites. As a result, the hookup resembles a vast network; information can traverse many alternate paths between two points. This introduces a flexibility and versatility missing in computers. It means data and ideas are much better organized in the mind—like the difference between a book with a complete, extensively cross-referenced index and one with a skimpy index. It also means that, compared with the brain, computers have a very simple-minded, no-short-cut way of doing a job.

Secondly, the brain forgets; computers keep stored information intact until told to erase it. While we find it a nuisance to forget things, it's really a very useful feature. It ensures that important, frequently-used information is on tap, while old telephone numbers and the exact word-by-word contents of this morning's newspaper get wiped out. Our huge "core storage" is constantly being updated to cope with our needs.

The third difference lies in the "software package" that comes with every fully installed brain. Software, naturally, means everything that isn't hardware. For an electronic computer it includes the programs that convert programs written in a user-oriented language (one like our own languages) into a form suitable for loading into and executing on a computer. It includes all the manufacturers' instructions, "libraries" of special-

purpose routines, and the accumulated savvy needed to make a computer useful.

Our brains are equipped with programs to control breathing, heartbeat, glandular secretion, digestion and a host of responses to external stimuli. We are programmed from birth with drives—"sub-routines"—which transfer control of body behavior from the conscious logical part of the brain to unconscious processing units. These drives have (or had) survival value in certain specific situations, when they switch on automatically. They're related to the reflexes, which perform functions we normally have no control over.

Our software package also includes the capacity to make use of signals from our input units—eyes, ears, skin receptors, pain sensors. Not all of these signals mean something at birth. A baby reacts to noises and pain, but he must *learn* to see. And this is an example of the most important difference between a new computer and a newborn baby: the baby can learn. In fact, he can't help learning, and after a few years a child can even begin to direct his own education.

At this stage it must be clear that the chances of making a computer just like the brain in the near future are bleak. What does this mean for poor HAL? Is he doomed to remain no more than a gleam in Arthur Clarke's eye?

Not necessarily. There's a catch: HAL doesn't have to reproduce human mental processes, he can *simulate* them. The idea is simple. In Clarke's words,

If one could carry out a prolonged

conversation with a machine . . . without being able to distinguish between its replies and those a man might give, then the machine was thinking, by any sensible definition of the word.

And that goes for speaking, playing chess, learning, and so forth. HAL doesn't have to do these things the way we do, he just has to do them.

Take HAL's voice. Bell Labs has developed software to enable a computer to synthesize speech. The computer is medium-large and medium-fast, nothing like a 7600 or 360/195. It takes phonetic text typed on a teletypewriter and turns it into sound, using a gadget like a small automated pipe organ. The output speech sounds a lot like HAL's. Of course, none of this system even resembles the human voice box, much less the speech center in the brain.

Recently the research group at Bell has developed a program to translate normally written English into phonetic text for itself. This program can't handle words like "lead" and "console" that can be pronounced more than one way, though. (Mankind is still safe from computers that make puns.)

There are already companies making commercial voice systems (using either recorded voices or synthesis) for special purposes, like telephone messages. There is no reason why such systems couldn't have vocabularies of thousands of words.

For many purposes synthesized speech need not have any intonation. Then it sounds staccato and metallic, like the computer in the original undubbed version of the movie *The*

Tenth Victim. Or with more refined analysis it could be given HAL's psychiatrist-like suaveness. Composing speech with emotional overtones to fit the message and the situation is a harder task.

There has also been a good deal of work on voice recognition systems. Here the computer must simulate human linguistic processes much more closely. For this reason, like people starting to study a foreign tongue, the computer finds it harder to understand spoken words than to speak. No two speakers pronounce a word exactly the same way; no man pronounces a given word the same way every time. The computer must recognize the essential features and disregard the irrelevant ones. And once this problem is licked, it's still a long way to a computer that understands the instructions "Open the pod bay doors" and "Let me in!" to mean the same thing. Linguists can't even *list* all the grammatical rules in natural languages, much less make them orderly.

Possibly a real HAL wouldn't have anything corresponding to human linguistic ability. He might just hold a huge library of words, phrases and sentences having to do with running the ship and keeping its crew content and healthy. He could be programmed with a few simple rules for putting words together, plus an ability to remember when he got things right. Shipboard life is repetitious; after a few weeks he would know all the crew's routine "by heart." This would work fine normally, but not in emergencies. Clarke's HAL must use a more sophisticated approach.

The problem of recognizing that the

same word spoken by different people is the same leads into the general subject of pattern recognition. How can a computer look at a picture of a bridge and know it's a bridge, if it's never seen that particular bridge before? How can it look at a man under different lighting conditions, in different poses, dressed or nude, shaven or bearded, and realize that all these inputs denote one individual? That's clearly a software problem, not just a matter of building better optical and acoustic scanners. HAL sees and hears as easily as we do, but existing computers and programmers are just beginning to make some headway in this direction.

The first step is digitizing the information. A visual input is made into a dot picture, like the ones in newspapers and many books. Suppose the input is just black-and-white; the picture is a rectangle of dots, perhaps 512 by 1024. Each of these dots could be blank or black or a shade of gray—say, sixteen different possibilities. That's four bits per dot, two million bits of information altogether—about equal to the contents of one reel of tape.

The next step is to extract a small fraction of this information to make comparisons with. Two million bits is an unwieldy number for this job, even for a computer like the 7600. Future computers might be able to handle it, but why use brute force just because it's available?

There are several ideas that have been put forward at this stage. Some programmers are trying to teach computers to fit simple geometrical figures like triangles and circles to the

picture. A face is a face because it has eye sockets on each side, two cheek planes, a triangular nose and a different color at the top and sides. The computer could easily adjust to rotating the head sideways or vertically. (It might have more trouble with beards and cigars or women's hats.) Something very like this is probably the brain's way of recognizing patterns.

Another technique is to look at the picture through a series of templates. Each contains a different pattern of randomly shaped holes. (They don't have to be real templates; the computer can handle the whole operation numerically.) There might be 200 such samples, each one yielding a single number from 0 to 63, measuring the total light passed through the template. This information can be stored.

To teach the computer to recognize faces, you have it scan a few dozen pictures of faces. Each one yields 200 six-bit numbers. Then the computer performs an elaborate statistical analysis on all of these sets of numbers to find what they have in common. Whatever it is, the computer files under "face." Then, when another picture comes along, the computer quickly examines it with all 200 templates and checks to see whether the numbers that turn up share the characteristics that define a face numerically.

This may sound clumsy—it is—and primitive, but it works. If the computer can analyze all the faces it sees to improve on the definition of face it already has, it will get better and better. If it is capable of looking at

details, it might learn which details distinguish one face from another. But once again, it's a long way to the point where HAL can look at a man with shaving cream all over his face and say, "Hello, Frank," or "Hello, Dave," and be right.

Very few people make any fuss over the fact that HAL plays chess. After all, chess is just a lot of calculation, and that's what computers are for.

The point that gets overlooked is that human chess players don't play chess that way. They don't look at a position and calmly check every possible move, and then the opponent's every possible reply, and then all their own rejoinders to each of those moves, and so on. The number of possibilities to be considered this way would be bigger than astronomical. No computer could ever play chess this way in a reasonable time, much less a man.

Chess players learn to look at a position and decide which moves are worth thinking about and which are obviously bad. Then they consider the possible replies to the one or two best moves, and perhaps one line of play for as much as four or five moves. Occasionally a grand-master has worked out a line of play as long as thirteen moves (and proved it by announcing "mate in thirteen"), but this is very uncommon.

The significant feature in this kind of thinking is its incompleteness. A very cursory analysis is enough to get good results in most chess positions. A chess player learns rules and principles of play which pick out the important features in a position and tell which lines of play are of enough interest to

follow in detail. This is called "intuition," "a feeling for the position," "positional play," and similar vague terms. Game theorists call the rules a heuristic strategy. Heuristic—that brings us back to the H in HAL.

It is possible to program computers to play chess. An international match between computers in Stanford and Moscow (the Russian won, as usual) took place several years ago. A better program called MACHACK, written for the PDP-6 at MIT, plays at about the class A level when allowed up to fifteen minutes per move. The "ability" of these chess-playing computers depends on how well the heuristic rules in the programs select information from positions. The best heuristics are modeled on the way human players think. But the programs are getting better; by 1980 the world champion will be a machine.

Checkers, though not the simple game most people think it, is much easier to program on a computer. Ten years ago, Dr. Arthur Samuel wrote a checker-playing program for an IBM 7094. After a few hours of play, the computer was able to beat Samuel consistently! This feat, the ability to improve its program, has deep implications. The computer amassed a backlog of frequently recurring positions and rules for dealing with them. It *learned*.

The ability to learn this way was part of the program Samuel wrote, so the 7094 was only "following orders." But it played creatively; it rearranged the elements of its experience to make new constructs. If well-chosen heuristics can make a machine learn from

experience and improve on what it has learned, why can't a better machine eventually simulate human thinking in all fields, even those requiring originality?

It will. At each level of progress skeptics have more difficulty maintaining that machines can never really be intelligent; at each level it will be easier to input and output data and the "man-machine interface" will be less of a barrier. We can foresee a time when there will be no difference in practice between talking to and working with a computer and talking to and working with a man in the next office. And that's HAL.

The computer doesn't have to undergo a critical transition, like Heinlein's MYCROFTXXX in *The Moon Is a Harsh Mistress*. It doesn't have to "come to life" or somehow acquire special neural circuits. To simulate intelligence convincingly, the only improvements a computer needs over the current generation are more capacity, greater speed, better software. The question is, will they be available by 2001?

For the last decade and a half, computer speed and memory size have grown by a factor of ten every two or three years. If this were to continue indefinitely, computers would probably be doing all our thinking for us by the end of the century. But it won't continue, because some parameters of computer design are already pushing against physical limits.

For example, add times in the fastest present-day computers are limited by the speed of light. (The speed of light or of electrical signals in semiconductors is about one-third of the

speed in vacuum.) The only way to make computers faster is to make smaller circuit elements or to have more circuits operating at once. Design engineers are using both approaches.

The technique for shrinking circuit elements currently of greatest interest is called large-scale integration (LSI). All high-performance computers now contain integrated circuits. An integrated circuit is made out of a single crystal, or chip, of silicon. It is manufactured by etching away parts of the crystal surface, treating the silicon that remains, and laying down conducting and resisting materials in the paths left by the etching process. This creates a network of tiny transistors, diodes and resistors. The result looks like a miniature circuit diagram, a fraction of an inch across—but it is the circuit!

Integrated circuits are "large-scale" when the chips contain 100 or so units, each equivalent to a single computer logic. One chip has a total volume in the neighborhood of 10^{-4} cubic inch. But larger assemblies are possible; some chips have been made with as many as 10,000 transistors.

The advantages of LSI are small size, low costs, and the potential to design and mass-produce components faster than by other means. In fact, electrical engineers regularly use computers to design circuits and draw masks for use in the etching process. This means big computers can help to build bigger ones. It's almost as good as Clarke's idea of automatically generating neural networks "in accordance with any arbitrary learning program."

Integrated circuits will continue to increase in complexity, eventually

containing 10^5 to 10^6 transistors. But as they grow, such circuits become less reliable. The chances are better than even that something will malfunction somewhere in an object that complicated. Since the whole thing is manufactured at once, there's no way to test each separate circuit element; either the whole thing works or it's a reject. Eventually it just doesn't pay to integrate anymore.

There's another problem in using LSI to aim at ultra-small components: heat buildup. An assembly of close packed integrated circuits puts out heat about as fast as the same volume of 500 watt bulbs. If the chips get hot, they fail. Making the chips larger (so circuit elements aren't pushed so close together) or spacing them to make room for air conditioning vents keeps them cool—but this defeats the aim of fast circuit response.

The heat buildup problem is common to all computer designs, whether they use transistors or not. All computers go through a vast number of steps in processing data. At each step, they take numbers from a previous step, do something to them to get a new set of numbers—and discard the old ones. That is, they throw away their scratch work. (No one would possibly want to see it all, anyway.) But loss of information is always accompanied by heat production—just as erasing a blackboard always produces chalk dust. Cooling systems can only get rid of this heat so fast. Like the speed of light, heat buildup imposes an ultimate limit on design.

The other big new development in computer design, parallel processing, is the key ingredient of the high speed

super-computer Illiac 4. A "quadrant" of sixty-four processing units work in parallel under the direction of a single control unit, which divides the job into subsidiary tasks and assigns them to the processing units. A smaller computer serves as Illiac 4's "front end," coordinating the flow of data into and out of the quadrant. Parallel processing only works well for big jobs that can be suitably shared around.

The original plan was for Illiac 4 to have a total of 256 processors in four quadrants, with the capacity to handle a billion instructions per second. The next generation of computers may have still more processors; and there is talk of a cable hook-up among the computers at all the national laboratories to permit them to work together. The net effect of all this is a trend toward removing one of the inherent weaknesses in digital computers, the small number of interconnections in their "neural networks." Parallel processing bears no resemblance to the brain's operation, but it promises to bring some of the brain's flexibility to computers.

Over the next ten or twenty years, the biggest advances in computer applications will be in software. There is so much important research on new programming techniques that no one project stands out. New programming languages, artificial intelligence, self-programming, computer control in industry, "time sharing" to permit one computer to handle thousands of small jobs by turns . . . and lots more. Some of the most important achievements will arise simply from perseverance by researchers. After all, it takes fifteen or twenty years to

program a human being satisfactorily; computers, unable even to learn initially, are naturally slow pupils.

The "Grand Tour" to the outer planets will be a giant step on the way to building HAL and his peers. It will begin late in this decade and last eight to twelve years; and it will be controlled under way by a new computer called STAR—for "Self-Testing And Repairing." STAR will be able to locate, diagnose and repair faults anywhere in the spacecraft, including itself. All the subsystems of the central processor will be triplets; they will solve each problem by majority vote. The test-and-repair processor (TARP) that serves as repairman for all the equipment will have *three* spares standing by. Most of STAR's routine duties will be just like HAL's: communications, guidance, processing scientific data, monitoring the propulsion system. (But no life-support systems this trip.)

STAR is still on the drawing boards at Cal Tech's Jet Propulsion Laboratory, but already it shows a clear family resemblance to HAL. But Hal's personality, his *humanity*, is missing. How does a computer acquire feelings? Not just by getting bigger and faster, nor by becoming more skillful at recognizing patterns of human behavior.

We believe that computers can have emotions. But not the computers you're going to see in the next thirty years. Only by giving the computer the flexibility and redundancy of the human brain will it be possible to instill feelings in a machine. It will be necessary to virtually copy man's emotional apparatus—and we're a long

way yet from being able to do that.

One thing to remember in making projections is the time lag involved in development work. Ten or fifteen years elapse from the time an idea first turns over the flip-flops in a scientist's head till it goes into production. A real HAL, ready to go in the year 2001, would have to be built in the early 1990's. It looks to us as though it can be done. Computers thirty years from now may

not function or look like HAL . . . but they'll be able to emulate his behavior. The next ten years, though, are the critical period for the new ideas that will make him a reality.

Or as Quinn Yarbrow says, the road to HAL is paved with good inventions.

—Greg Benford
& David Book

(CONTINUED FROM PAGE 35)

word. Suddenly she felt lonely and afraid. What if all the talk about class three was just propaganda to get people to volunteer?

"Mom, Mom. It's here." Billy rushed in with Suzy trailing behind. He threw an envelope onto her lap then continued to jump up and down.

Alice looked dumbly at her son then down at the envelope.

Billy yanked at her arm. "Open it, Mom! Open it!"

She shot up from the bench and slapped Billy. "Stop it!" she screamed. She dropped to her knees and gathered Billy in her arms. "I'm sorry, Billy. I'm so sorry." Suzy whimpered and squeezed herself into her mother's embrace. Hands shaking, Alice picked

(CONTINUED FROM PAGE 87)

as if he were one of those mindless, anonymous little shellfish whose featherlight remains are scattered across, and are part of, all the shores of eternity.

For a moment the warm, bright room seemed cold to Carewe, then he understood that he was a different person from the Carewe of three months earlier—and had no regrets about the change. The child Athene was carrying was not his; but, in

up the envelope and tore it open.

United States Government
Department of Euthenics
(Human Betterment)

Dear Mrs. Granger:

You are hereby notified of your advance to Class Three, thereby permitting you and your family to live in a suitable Class Three dwelling and to enjoy the standards and privileges of said Class Three. Aforementioned advance has been made possible for said Alice Granger by the supreme sacrifice of voluntary decedent Joseph Granger.

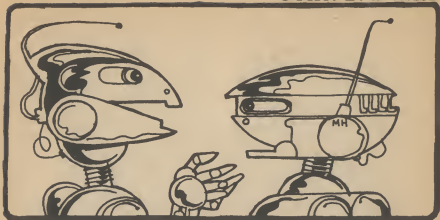
Very sincerely yours,
John C. Ludwell
Secretary
—Allen Rivers

another sense, he was the father of all the future Carewes. That responsibility was enough to replace the fulfilment of physical parenthood, and it would have to sustain him if ever he and Athene went separate ways.

He picked up the hypodermic, fired its contents into his wrist in an icy cloud, and went down to the beach to rejoin his wife at the beginning of their long, long summer.

—Bob Shaw

AMAZING STORIES



* THE CLUBHOUSE

For those who tuned in late, this is a column of reviews of fanzines, the amateur magazines published by science fiction fans, who are referred to in the mass as "fandom." Fandom has been around for a long time, going through lots of changes since the first fanzine in May, 1930. If it seems as though you've walked in on the middle of something, it's because you *have*. But stick around a while; you might like it.

FOCAL POINT vol. 2, #3-10, April-August, 1970; 6/\$1; biweekly, from Arnie Katz, Apt. 3-J, 55 Pineapple St., Brooklyn, NY 11201, and Rich Brown, Apt. D-4, 410-61st St., Brooklyn, NY 11220; 10, 10, 12, 10, 16, 12, 12, 6 12 pp., respectively, mimeographed.

Two columns ago, I reviewed the first two issues of FOCAL POINT and said it had a lot of potential. It's been fulfilling that potential admirably.

Arnie and Rich started FOCAL POINT because they felt that LOCUS, which at that point had a virtual monopoly on the fanewsmagazine field (all the other newsmagazines were regional or otherwise specialized), was not doing the job it should do. To judge by FP's steadily-rising circulation and the response the fanzine has generated, I would say they were right.

FOCAL POINT presents the news in a concise format, giving each item its own heading and trying not to take one hundred words for what could be said in ten. The reporting is generally accurate, although there have been a couple of cases of misreporting, and a quick glance through the most recent issues of FP and LOCUS shows considerably more real news in FP. For this alone the fanzine deserves commendation. But what really makes FOCAL POINT unique is that, in addition to news, it publishes a great

number of longer articles—often detailed convention reports, but also pure entertainment items. This makes FP more than just a newszine; with twelve pages each issue, articles, and even a lettercolumn, it becomes a truly interesting fanzine. Going through the issues at hand, we find a report on the Lunacon by Rich Brown; two installments of Steve Stiles's "Harrison Country" (the account of his trip to the British National SF Convention in 1969 via the Transatlantic Fan Fund, or TAFF); two installments of Harry Warner's renowned column on fan history, "All Our Yesterdays"; subtle humor pieces by Charles Burbee and Arnie Katz; biting commentary on this year's Hugo nominees by Rich Brown; a column of chatter by Rich's wife Colleen; an excellent Midwestcon report by Ted White; and fanzine reviews by Rich, Arnie, and Greg Benford, which range from adequate to excellent. Quite a line-up for eight issues of what is ostensibly a newszine.

The personality of FOCAL POINT is fannish; that is, the emphasis is on fans and fandom rather than on science fiction, although the editors do print sf news. They have said they don't want to ham up the reporting of straight news items, but even so the writing makes you feel involved and occasionally makes you laugh while imparting to you its load of information. In the non-news parts of the zine, you'll find an emphasis on high-quality writing and humor, as well as dashes of fan history (on the theory that to be a fully-aware fan you need some knowledge of fandom's past as well as its present). I find FOCAL POINT one of the most welcome sights

in my mailbox.

In this issue, a Project is launched. A fund is being gotten up to bring Bob Shaw, well-known fan and rising pro from Belfast, Northern Ireland, to the World SF Convention in Boston next year. (*Bob Shaw is the author of "One Million Tomorrows" in this issue. —TW*) Although begun through FOCAL POINT, the SHAW Fund is a fandom-wide project and seeks support in all quarters. The goal is \$1000. If you should want to contribute to this fund, send a check for any amount to Richard Brown, at the address above. And come to Boston next Labor Day weekend and meet Bob Shaw.

Whether you share the editors' opinion of LOCUS or not, FOCAL POINT has become an indispensable fanzine. *Highly Recommended.*

TWAS EVER THUS #1, Spring, 1970; 25¢ or \$1 a year; irregular, from Jonh Ingham, 21157 Kingscrest Dr., Saugus, Calif. 91350; 36 pp., mimeographed.

TWAS EVER THUS is one of the best examples I've seen yet of a relatively new phenomenon in fandom: fanzines produced by young fans who are thoroughly immersed in the head culture. That's a very general statement, but it describes what is an increasingly-heavy influence on fandom. The advantages of this influx are enthusiasm and new angles on old problems; the disadvantage is people who discover fandom, mutter "Oh wow!" under their breath, and dash right in rearranging things while thinking that they know what it's all about.

TWAS EVER THUS doesn't suffer

strongly from this malady, but the first article in this issue touches on it. The article is "How to Play Communication Company," by Chester Anderson, which I believe was reprinted from the *Los Angeles Free Press*. Anderson describes how he and a few others set up a free printing and distributing service in the Haight in 1967, made possible by their wonderful discovery of the mimeograph. He explains very well how their operation worked and how to set up such a project of your own. Now this may come as delightful news to the hip subculture, but to an sf fan, who has been reading and publishing mimeographed fanzines for years, it can't help but be amusing. Anderson comes on like a goshwow neofan (not in the tone of his writing, but in his attitude) who has had a little bit of experience and who triumphantly passes his newfound knowledge along to those with even less experience than he. As a fan, I can't help but gasp and laugh when he blithely mentions such an extravagance as electrostenciling even printed pages, rather than typing them directly onto an ordinary stencil. It's an interesting article because of the history given of the Haight in its (if you'll pardon the expression) heyday, but editor Jonh Ingham seems to take it more seriously, judging by his introduction to the piece: "EDITOR'S NOTE: If nothing else, you may think of this as TWAS EVER THUS' position paper. It is also included (believe it or not) as a guide (somewhat) to putting out a fanzine. It isn't aimed specifically at fanzines, but it's close enough. It might also be the catalyst needed to start a new type of fanzine—a communications company

fanzine."

The same semi-informed enthusiasm seems to be behind the whole fanzine. Jonh (who deliberately spells his name that way, unless AMAZING's ever-conscientious typesetter "corrects" it) remarks in his editorial, where he is describing his intentions for his fanzine: "If all works as intended with TET, you will be miles ahead of the game if you subscribe. (It will definitely be going up with #2, and possibly again with #3.) Assuming I don't go bankrupt in the process, I want TET coming out at so many different intervals and in so many different formats that you're never going to know what to expect next. One time it may be like a road map; the next time offset; the next time spiral bound. One issue may be 100 pages, the next issue 2 pages. You may get 2 or 3, days or weeks apart, then nothing for a couple of months. In short, I intend printing whenever the mood strikes me, be it to tell you of the fantastic movie I saw last night, or to reproduce all the irate letters asking just what the hell is going on. (It would be helpful to read "How to Play Communication Company," since that was the catalyst (somewhat), and is why it is included.)" This is an admirable policy, and I expect it will make for a fascinating fanzine, but again I question how well Jonh really knows what he's fooling around with.

Actually, most of this criticism should not be leveled directly at TWAS EVER THUS; it's a general sort of criticism, which I think needs saying, but TET shows enough talent and competence to carry it out of the class of an uninformed neofanzine. The

son is that it reads like anything but a neofanzine; in fact, it reads better than many fanzines that have been around for years. Much of the content is reprinted, but it's well chosen and provides a meaty, interesting fanzine. The two other *Free Press* reprints are an article by Michael Ross in which he discusses the medium of film and tells us we should ignore critics completely, and a longer, more thought-provoking article by Gene Youngblood called

"Are the Rolling Stones All They're Cracked Up to Be?," which is subtitled accurately, "A Nihilistic Spasm Disguised as a Record Review." If there's anything but a rock-solid opponent of the Youth Culture—and especially if you're a True Believer with a vicarious thin skin over your sacred cows—you'll get angry somewhere through Youngblood's scathing but knowledgeable attack. I know I did. His article is very worthwhile as a tool for shaking up complacent "hip" people; how do you react to a sentence like this: "I see a generation that will jump up to chant the Om at the drop of a hat just as the S.A. used to sing 'Horst Wessle' in an orgy of patriotic frenzy"? Sometimes he goes overboard and becomes infuriating, as in this passage: "I see a generation ignorant and arrogant enough to take credit for an evolutionary process that was and is completely out of its control, a generation like all generations that had absolutely no option in being anything other than what it is." But even this excess of bile is helpful, for it keeps the reader from sinking into Youngblood's rhetoric and implicitly believing his platitudes. The article forces you to

think.

There's a much more fannish, lighter reprint by Greg Shaw; it's several sections from the editorial column of his hard-to-get fanzine. Greg has a great ability to put words together; he recently returned to fandom after a period of minimal contact and activity, and he's one of the best relatively new writers around these days. Here he rambles pleasantly on his reactions to the SFCon (a regional convention held in the San Francisco area last March), a flashy and incredible character he knows named Stacy, and various other more-or-less related people and things. Greg's light touch helps to balance out the heavy *Free Press* reprints. There are also ramblings by the editor—the editorial, fanzine reviews, a review of the Grateful Dead live, an article on the possibilities inherent in filming *Lord of the Rings*—and a lovely melange of fannish cartooning and photos and such clipped from various magazines and newspapers, which illustrate the whole fanzine very well. (One of my favorites was the Jack Armstrongish he-man, captioned "Restore Your Full Masculine Potential—the way the ASTRONAUTS DO!") Along with this issue came NEVER EAT A FANZINE #1, which is some sort of four-page supplement to TET, consisting of remarks by the editor on the Westercon and rock music.

Jonh Ingham seems to have the talent to pull off his offbeat ambitions. You really ought to send him some money and see what he produces next. *Recommended.*

Other Fanzines:

The fanzines marked with an

asterisk (*) are especially recommended.

*CROSSROADS #9, June, 1970; 25¢ or 12/\$3; irregular, from Al Snider, Box 2319, Brown Station, Providence, RI 02912; 30 pp., mimeographed. A general all-around interesting fanzine, although thin on material, featuring excellent artwork by newcomer Grant Canfield.

ERB-dom #36, July, 1970; 50¢, \$2.50/year, \$4.85/2 years, \$7/3 years; irregular (?), from Camille Cazedessus, Jr., PO Box 550, Evergreen, Colo. 80439; 20 pp., with 20 pp. of inserted ads, offset. The leading fanzine devoted to Edgar Rice Burroughs, with an emphasis on other things as well, such as this special issue on 2001: A SPACE ODYSSEY. Back copies of this issue will be available, without the ads, for 25¢.

SF COMMENTARY #12-3, June & July, 1970; 18/A\$3; monthly, from Bruce R. Gillespie, PO Box 245, Ararat, Victoria 3377, AUSTRALIA (US Agent: Charlie Brown, 2078 Anthony Ave., Bronx NY 10457); 26 pp. each, mimeographed. Just what the title says.

COFFINWORM #2, Summer, 1970; 15¢ or 4/50¢; irregular, from Carl Gafford, 140 Lone Oak Dr., New Milford, Conn. 06776 (publisher), and Gordon Matthews, 8 Perry St., Union City, Pa. 16438 (editor); 16 pp., spirit duplicated.

NEXUS #1, July, 1970; 15¢; irregular, from Lane Lambert, Route #2, Boaz, Ala. 35957; 8 pp., mimeographed.

BEABOHEMA #9, May, 1970; 60¢ or 4/\$2; irregular, from Frank Lunney, 212 Juniper St., Quakertown, Pa. 18951; 70 pp., mimeographed.

CHANTS OF MADNESS #9 (formerly ISFANEWS), June, 1970; 25¢ or ISFA dues of \$1 per year; irregular, from David M. Gorman, 4022 Meadows Dr., Apt. A-3, Indianapolis, Ind. 46205; 32 pp., mimeographed. The official fanzine of the Indiana SF Association.

INFINITUM #3, May, 1970; 50¢ or 3/\$1.50; bimonthly, from Dave Lewton, 735 E. Kessler Blvd., Indianapolis, Ind. 46220; 32 pp., mimeographed.

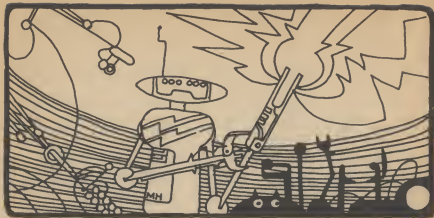
B LETTERZINE #1, June, 1970; available with INFINITUM; bimonthly (on alternate months from INFINITUM), from Dave Lewton, 735 E. Kessler Blvd., Indianapolis, Ind. 46220; 26 pp., mimeographed. This is effectively the lettercolumn of INFINITUM, excerpted into a separate fanzine. Don't ask me why.

CARANDAITH vol. 2, #1, Jan., 1970; 75¢; irregular, from Alpajpuri, 330 S. Berendo St., Los Angeles, Calif. 90005; 74 pp., mimeographed. This is the journal of the Australian Tolkien Society. You tell me why it's published in the United States.

BETWEEN WORLDS #1-2, Spring & Summer, 1970; 35¢ or multiples thereof; irregular, from Stephen Compton, 6532 Estates Dr., Oakland, Calif. 94611, and Wellman Pierce, 1910 Sacramento St., Berkeley, Calif. 94702; 24 & 26 pp., respectively, multilithed (?).

WINNIE 47-9, June-July, 1970; 6/\$1; sort of biweekly, from Mike

(CONTINUED ON PAGE 129)



...Or So You Say

Letters intended for publication should be typed, doubled-spaced, and addressed to Or So You Say, c/o P.O. Box 73, Brooklyn, N.Y., 11232.

Dear Ted,

Self-congratulation is a tricky game, especially in a reply in which you had to admit most of the errors in your review of *Black Easter* and second-guess the others. This time, you contrast my 20 (not 19) novels of the past 30 years with your record as "the author of" 13 in the past six years. In writing to you, I played fair and counted only those books which had been published up to the time of your review. Playing it your way, I have written and sold 37 books, as well as 213 other titles including three feature film scripts, plus one novel still unsold, over those 30+ years, during all but three of which I also held down a regular job. I do not regard prolificity

per se as either a virtue or a vice, but I prefer not to have my record falsified. Yours had not been called into question and is quite irrelevant.

As for the book's role in the trilogy, my scrapbook contains 63 reviews of *Black Easter* which antedate yours, and of these exactly eight so much as mention the trilogy—and two of these are from Dar-es-Salaam, presumably a hotbed of WARHOON fans. Your contention that "all this talk . . . has successfully obscured all direct criticism of *Black Easter* as a novel in its own right" is a straw man of your own invention.

In support of the universal boredom you claim generated by my 12-page conjuring scene, you adduce an unspecified number of unpublished comments by nameless persons. Of 68 reviews to date, four report boredom with that scene, and two of them are by you. More invention. And why should

you be forgiven for not counting the demons in the scene? You specified 48; if the actual number didn't matter, why give one, and get it wrong to boot?

I am not interested in arguing your opinions of the book, still less those in the realm of psychopathology. My intention was only to correct your many errors of fact and implication. Since you now seem bent on compounding them, even to the extent of invoking anonymous allies and private conversations, this discussion is closed as far as I am concerned.

James Blish
Treetops
Woodlands Road
Harpsden, (Henley)
Oxon, U.K.

Jim, I've published your letters intact and complete, exactly as you've written them. Under the circumstances, your remarks (in both letters) that you don't wish to have your "record falsified" seem thin to the point of irrelevance, and the implication that I have been falsifying your record is offensive. In this letter you are still beating the same limp horses you assailed in your first letter—still, in fact, attacking minor or irrelevant portions of my original review of your book. (Where you found a second review of Black Easter by me is a total mystery to me, I have written only one.) You ask why, if I didn't count the demons invoked, I specified 48—which, you claim, is not the correct number. P. 130: "Taking up the pen of the Art, Ware made a list. When he was finished, he had written down forty-eight names. Considering the number of the Fallen, that was not a large muster, but he thought it would

serve the purpose." Frankly, I'm pleased by your last line; it pains me to see a man I've respected for years as an author and critic descend to the level of pettiness you've exhibited in these two letters. —TW

Dear Sir:

I view with horror your announcement that you plan to use a larger type in AMAZING. I had begun to have hopes . . . but the grave awaits.

You do this, of course, for economic reasons, and not for your hypermetropic readers. Larger type will mean less wordage per issue, less payment to contributors, a magazine less expensive to produce (on the average), and hence more profitable. This is, I presume, your line of reasoning.

But the fallacy here is that it will also mean a loss of sales. Your recent increase in popularity and sales is due solely to the improvement in the magazine since your ascension to the throne, not the least of which are the uncut novels and the features. You know as well as I that a decrease in wordage will mean a loss of some (if not all) features and horrid editorial cutting on the novel. Most readers, you will find, will be appalled, and many of these will no longer buy the magazine (myself included). What then? Well, I'll tell you: the above-mentioned grave.

GALAXY and IF have tried decreasing wordage lately, and circulation is dropping constantly. If I want a badly-mangled novel, I can read these magazines. The first issue of

the resurrected **WORLDS OF TOMORROW** carries the word-saving practice to an almost infinite degree. These three haven't long to live. Nor will **AMAZING**, if you carry out your abominable threat/promise.

The science fiction magazines must be saved. As editor of **AMAZING**, you can help to do so.

Carl Glover
Route 1, Box 436
Saint Paul, Va., 24283

*Carl, you make a number of false assumptions, and I'm afraid the most serious one is that **AMAZING** has had "a recent increase in popularity and sales." An increase in popularity, yes—among those who are buying the magazine. But quite unfortunately not an increase in sales, the very opposite. I don't know where you picked up your information about the circulation of our competitors, but sales for the entire field are off, and have been off for the past year. The pinch is hurting us all—and we have each, as our own publishers dictate, sought out answers to prolong our magazines' survival. When I assumed editorship of **AM.** and **FANTASTIC** I was certainly guilty of my naivete, that the very changes you and other readers have applauded would give a boost to the magazines' sales. Well, the recession might have hit harder, had I not introduced those improvements—it's a moot point. As for the change in our type size, I shall await your judgement of this issue. However, I must point out to you that a) the loss of wordage per page with our new face is small—about fifty words or so—while I think you'll agree the readability is way up, b) we've not cut the features at all and*

c) as long as I remain editor of these magazines there will be no "horrid editorial cutting on the novel," nor, indeed, on any story. Okay? —TW

Dear Mr. White:

Ouch! Have you tried to read "Orn" since its publication in the September issue? If you haven't—try it, but I'll make it easier for you than for the readers:

To make sense out of the story, you must turn from page 97 to page 100, then to 99 to 102, finally, from 101 to 98. It is easy, too easy, to misplace a slug of type of four or five lines . . . but the above misplacement—wow!

C.E. Seaman
429 S.W. Fourth Ave.
Portland, Oregon, 97204

Your letter prompted me to do some checking, and while you're right that the pages are out of order, you're wrong about the order in which they should be read. Actually, pp. 98 & 99 and pp. 100 & 101 are reversed in order. That is, p. 100 is the true p. 98, and vice-versa, while p. 99 should be p. 101. When we discovered this error, we checked with our typographer, and found that the error had been made in assembling the "flats" for these two sets of pages. We use "cold type," that is, photo-composed type which is pasted down on page-flats, or mechanicals, for offset printing. After the story had been properly pasted up, these two flats were accidentally reversed in order before page numbers were added to them. My apologies to

both Piers Anthony and you, the readers, for this mixup. My apologies also Philip Jose Farmer for the typographical mixup on page 11, in the same issue. The error there was in pasteup: Two lines from the third paragraph of the left-hand column were inserted before the second paragraph. In both cases, these errors slipped past us because we did our proofing from the galleys—the unpasted columns of set type—before they were made up into pages. As a result of this unfortunate series of errors, we've revised our proofing schedule to proof the completed pages, thus, hopefully, allowing us to catch any future errors in time to correct them. I had hoped such errors were long behind us, the lesson, I guess, is that pride can still proceed a fall. —TW

Dear Ted:

I'd like to correct something you said about the Chris Anvil story in the September AMAZING. There were two prior stories about Sam and Al. "Bill For Delivery" was in the November '64 ANALOG, as well as the Ace 1965 collection. The second story was in January, '66, and was titled "Untropy".

David Stever
7 Lake Road

Cochituate, Mass., 01778

Thanks, I missed the second story. And Terry Carr at Ace pointed out to me that the 1965 World's Best Science-Fiction is now reissued as First Series. —TW

Dear Ted:

I can't let John Berry's evil review of

SCIENCE FICTION REVIEW in *The Clubhouse* of your September issue pass without comment.

At the beginning of his column he mentioned prejudice and hoped he could compensate for his own in his reviews, but obviously John is at heart a "fannish" fan and as such isn't much interested in science fiction or those amateur magazines which are almost exclusively concerned with it.

His obvious and perhaps still unconscious prejudice was revealed in his suggestion that FOCAL POINT could profit by using longer fanzine reviews. Then, concerning SF reviews in SFR he said: "Ten pages of book reviews? Are you kidding? I haven't read any of them, nor do I intend to." That, I submit, is pre-judging and bias.

I have a suspicion that John feels betrayed by me, somehow. My interests and my magazine have shifted more and more toward science fiction, its writers and the craft or art of its writing. When I published PSYCHOTIC he loved it; when I changed title and emphasis he grew less and less enthusiastic. Now that "fannishness" is virtually gone from SFR's pages, now that Poul Anderson, John Brunner and Piers Anthony are regular columnists (and you, Ted, are an irregular columnist) and other well-known SF authors such as Damon Knight, Harlan Ellison, Philip Jose Farmer, Kate Wilhelm, Samuel R. Delany, James Blish, Terry Carr, Alexei Panshin, Greg Benford and many more have written for the magazine . . . now he hates it.

I'm not surprised that there is little in SFR anymore that John wants to read. I am surprised that he cannot see

that the readers of AMAZING, who are obviously interested in science fiction even if he isn't, might be better served by more objectivity in reviewing.

John infers that there is a sort of SFR clique in existence whom I lead around . . . He seems to object to people liking the magazine. His was a subtle, "dirty" way of putting-down over a thousand SF readers, fans, authors, editors and publishers.

SFR won the Hugo award last year as Best Amateur Magazine, and is on the ballot for that award again this year. I believe the magazine is getting better, not stagnating as John thinks.

I could go on and on, but I suspect I am close to exceeding the wordage I might claim in rebuttal to his review.

John may have changed his opinion after having seen issues #37-38-39.

I'll end by offering a free sample copy of the latest issue of SFR to any AMAZING reader who sends me his name and address—so that he can judge for himself.

Richard E. Geis

SCIENCE FICTION REVIEW

P.O. Box 3116

Santa Monica, Calif., 90403

Well, to be truthful, Dick, my opinion of SFR is (as you must know) much closer to yours than to John's. However, I think that John made his prejudices sufficiently well known that they would not in themselves be misleading. In any case, your offer is a handsome one, and I hope our readers don't completely overwhelm you with their requests for sample copies—of a fanzine which I, at least, do recommend. —TW

Dear Ted,

I was leafing through a book entitled *Creative Writing* in a drug store. I noticed that it had a chapter on science fiction writing and immediately turned to that chapter.

You would have had a good laugh, Ted. Of the three or four pages devoted to science fiction, all but the first and last paragraphs were nothing but uninhibited (and, at times, utterly ridiculous) praise for Ray Bradbury.

True, praising Bradbury does not teach you much about writing, science fiction or otherwise. I will overlook this, however. What really struck me as instructive was the author's statement that there are "forty or fifty" magazines that publish *only* science fiction and/or fantasy.

This was a terrible blow to my ego. I thought that I was at least fairly knowledgeable on SF as a field. Alas, I have only been able to find about twenty-five SF magazines on the stands, and most of these are worthless to a prospective writer, for they publish only reprints.

Ted, whatever you say about poor sales can't be true. *After all, there are forty to fifty flourishing SF magazines on the market!*

The author (with all due respect) obviously doesn't know what she's talking about. Or, if she does, perhaps she could send me a list of the forty to fifty SF magazines?

The book, incidentally, is copyrighted not during the days of the pulps—as one might suspect—but 1968!

Maybe it was wishful thinking . . . ?

Scott Edelstein

1917 Lyttonsville Road

Silver Springs, Maryland 20910

It certainly sounds like wishful thinking. Perhaps the author is plugged into an alternate universe in which sf has been more prosperous! —TW

Dear Ted:

This letter is in reply to your editorial in the July AMAZING, where you mention the fact that Dr. Fredric Wertham (the noted witch-hunter) will be investigating sf fanzines and fandom. I read some years back in an article on comic books and superheroes that Dr. Wertham had come to the conclusion that Batman and Robin, The Boy Wonder, were having a homosexual relationship. You pointed this out also. I recall thinking, at the time I read the article, "That's absurd." I reflected upon those years when I was an avid consumer of Batman. Odd . . . I noticed no such relationship, though the man insists that it must have been obvious to me. I decided that it was the conclusion of an obsessed man who could find something bad in any thing. As you say, one might indeed wonder "if the good doctor ever himself took a Rorschach test . . .".

I quite agree with your conclusion. He is, from his past record, a dangerous fanatic. All witch-hunters are. The Joe MacCarthies are not dead, and people listen to them just as avidly as they did back in the Fifties.

Witch-hunters are dangerous for a good reason. They have a preconceived attitude they want to prove, and rut around until they have the data which fits it, ignoring that data which disproves it. In many cases, this disproving data far overwhelms any

contrary evidence. In Dr. Wertham's case, it is likely that he comprised the faulty operational definition "Comic books are one of the major contributor's to juvenile delinquency," and looked for the facts he felt would support it. He'll do the same with his preconceived notion about sf fandom (*sigh*). One sees what one wants to see. The man's biceps with the supposed "dirty picture" (and that's another point: what constitutes "dirty", or rather, obscene?) in it is an example of Wertham's seeing what *he* wants to see. You know the old saying: "When facts disagree with your pet theory—ignore the facts! That makes simple minded solutions look good!"

Dr. Wertham will select data that supports his theory, ignoring that which does not. He will then brand sf fandom and its fanzines in the way he has already planned. And since sf fandom and fanzines are a direct outgrowth of science fiction in general, he'll start on that next (have to keep in the public eye, you know). That scares me. Scares me because there are a hell of a lot of people who have no contact what ever with sf who will actually *believe* him.

I can hear it now: "Martha! No more sf for Johnny—this doctor fella says it'll pervert him!"

I graduated from Batman and Superman in the eighth grade, and started reading sf (Andre Norton and Robert Heinlein) in the seventh grade. I'm well acquainted (through personal experience) with the distorted image science fiction already has with a non-sf reading public. I'd be loath to see it warped further from its true, literary dimensions by a man who knows

nothing about it. I've turned my share of people onto sf in the belief that it has something to offer to this world, so naturally I'm inflamed.

Maybe I'm being too apprehensive—I hope so . . . But somehow, I get the feeling I'm not. I don't think I'm alone.

In the meantime, Ted, keep up the excellent work. I know you've heard it before, but I'm going to say it again. That's why I'm reading both AMAZING and FANTASTIC again. In fact, that's why I have subscribed to both magazines.

Gene Van Troyer
1511 SE Mall

Portland, Oregon 97202

In the 10th issue of Frank Lunney's BEABOHEMA, the Good Doktor announces his alarm that sf writers might be influenced by the theories of Konrad Lorenz: "According to my studies, science fiction and fantasy fiction writers would be greatly misled if they would follow these theories, according to which human violence is an inherited, biological, ineradicable instinct. I have refuted these ideas, as you can see in the marked passages of my book A Sign for Cain." Three quoted paragraphs follow. The first says simply that sex and the desire for food are "positive biological instincts," but that "a capacity for violence" is not. The second knocks studies of "the instinctive behavior of animals," concluding, "Whatever value these nature studies and animal observations have, their arbitrary application to human violence is misleading. The claim is made that our whole culture developed as a compensatory consequence in reaction to 'our killing

imperative.' Such neo-Spenglerian ideas in modern garb have gained great influence. They are not only scientifically mistaken and historically unsubstantiated, but are socially harmful and politically reactionary." I find that last line fascinating to contemplate. Are behavioral scientists to be circumscribed by the political impact or coloration of their findings, now?² Wertham's final paragraph is pure rhetoric, but an excellent example of how his mind works: "It is hard to see what pertinence flatworms, baboons, geese, wolves and 'territoriality' have to the very real outbreaks of the violence around us. They represent more than the emergence of an 'instinct of aggression.' The facile way in which ethologists first interpret animals as if they were humans and then humans as if they were animals reminds one of a member of the Pickwick Club. Compiling a lecture on Chinese metaphysics, he proposed a simple amalgam of the entries under China and those under metaphysics—haphazardly and without meaningful interpretation."

In other words, 'What have we to do with animals?' Despite Wertham's irrelevant analogy, the answer is everything. We are animals, in every biological sense, and the Good Doktor's theories have been proven false by all the research done over the last twenty years. What he is perpetuating is the superstition that our relationship with the animal kingdom is too remote for any conclusions to be drawn from it. Now, on the other hand, we know that we represent part of a spectrum of terrestrial life—and that we share

many common links with the mammals, and especially with the primates. Nearly every criterion originally posed to define our differences (our superiority), such as the use of tools, has now been debunked. And if the "territorial instinct" is not at the root of a great deal of the daily violence in this country, what is? When teenage gangs defend their "turf," when laborers close doors to protect their jobs, and comfortably settled lower-middle-class people segregate their neighborhoods—all from encroachment by "outsiders," what else is it? What else can we call it? My tom cat has a simpler, but parallel approach: he "sprays" the perimeters of our backyard with his scent and woe betide the stray who crosses those lines.

Dr. Wertham is a reactionary—without himself realizing it—devoting himself to 19th Century ideals, Biblical superstitions, and the simple dictum that contradictory evidence must be suppressed. However, the more I see of him in the letter columns of the fanzines, the less I consider him a real menace to fandom. His latent fanaticism is a danger, of course, but he does seem more interested in communicating to us—as a preacher of the Gospel among the unenlightened—than anything else. —TW

Dear Ted:

Along with a reputable law firm, I'm starting a new paperback publishing company, non-sf, but willing to work toward sf.

Our sales base is extraordinarily sound; the subject matter unexploited.

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Some writers may wish to be paid in the new way and also collect profit from corporation growth and earnings. It therefore seemed appropriate to place this sketch before writers. To that end I've asked Gordon Dickson (*President of the SFWA*) for advice.

Keep in mind that everything is open and details easily forthcoming upon request, by phone or letter.

There is little possibility of satisfying SF fans who want to invest less than the minimum because of the 29 stockholder ceiling; though some groups may wish to pool resources and purchase under a single name.

Whether or not you have a personal interest—and I wish you did—we'd appreciate any advice and publicity you'd care to give.

Perry A. Chapdelaine

Rt. 4, Box 137

Franklin, Tenn., 37064

(615) 352-0625

While my financial status doesn't allow me to invest in this enterprise, Perry, I

hope the publication of your letter here will prove to be of help to you. —TW

Dear Mr. White,

I've decided that I've been a member of the 'silent majority' of science fiction readers long enough. Of course, after reading through this letter you may advise me to return to that state.

I started reading SF in 1962. My hometown newsstand stocked all six of the major prozines going at the time (they're still around, but a couple others have come and gone in the meantime). I find now, having moved to several different areas of the country, that this was an exceptional case. I recently solved the problem of availability (your publications, sadly, being the hardest to find) by subscribing to all of the above-mentioned magazines. Also, I have just subscribed to SF REVIEW, and plan to look into fanzines as soon as I can replenish my capital. Hopefully, I believe this is what you call dipping your toe into the pool of fandom.

Anyway; to complete the background to this letter I did not read much SF (in the magazines) from 1968 through the first quarter of 1970. Therefore I missed most of the "war" between the New Wave and the Old Wave (a condition that I'm trying to remedy at present). I kept on reading a few novels here and there, some of which one could probably classify as New Wave, if one had an inclination to do so. Here I am, quietly enjoying a novel (like Ballard's *Crystal World*) and not even knowing that I was probably reading *controversial material*. Oh what blissful ignorance to

be able to sit in my favorite chair having a good time with an interesting book, not knowing that behind my back SF people in two camps are screaming obscenities at each other.

Well, now that I've bitten into the apple (thanks to your magazines, and others) I'm at least subconsciously aware that what I'm reading may be Old Wave or New Wave, and it bothers me. I would like to expend a few words on the subject to show how silly all the yelling is.

First I'll pacify (or enrage) both sides by stating that I'm currently reading *Stand on Zanzibar* and *Bug Jack Barron*, and enjoying both. In the same breath, I can honestly claim that I get the same feeling of enjoyment from reading through an issue of *ANALOG*. Also, to keep the fantasy and science fiction extremists out of the picture, I like both of them, too. Don't you sometimes wish that all of your readers were as easy to please?

To get back to the main issue (if there is one; I think I'm beginning to ramble), let's look at a few of the differing points of view that I think exist in this matter. First, both sides seem to say that the other's writing is a bunch of trash. I'll go along with that; there's trash in all of literature. If there weren't any bad stories, how could you know that you've found a good one? If there is a New Wave of SF as well as an Old (I haven't admitted anything yet), I think that I've read some pretty bad (and good) stories on both sides. My idea of a good story goes in degrees. A class one story is one that I read all of the way through (I don't think I've finished a bad story in my whole life). That story becomes a class two piece of

work if I enjoy reading it (meaning I'd read it again if I had it to do all over). The ultimate good story is a class three. This is one that gives me some kind of feeling after I've read it (remember, I never finish bad stories). This can be anything from a cold, clammy feeling, to a chuckle, to a deep thought, to a finger pointed in the direction of the offending work.

Another viewpoint is that the Old Wave believes in a future for mankind (other than complete oblivion) and the New Wave says that there is no hope. Now this is a nice way to divide up the beliefs in the future. Aren't these really the two alternatives to man's tomorrow? I don't know of too many people who are ho-hum about the future. If you want to call optimism Old Wave and pessimism New Wave, fine. But, I don't think that either side will claim Clarke as New Wave, nor will anybody really accept the fact that Aldiss' *Long Afternoon of Earth* is New Wave (and I think Aldiss is now considered a member of Said New Wave).

The last point of view I want to look at (seeing that this letter is getting too long and I haven't found any other major points in my reading of the controversy) is that the Old Wave is written in the stock manner (standard prose) while the New Wave is experimental in nature, the ether, so to speak, being the limit. If this is true, the New Wave has been around for a long time. *The Demolished Man* was quite unique (and still is), and I believe people admitted the fact back then, but nobody has ever claimed it as New Wave. Also, JWC has been publishing unusual stuff for several years now. I'm

referring to the "memo" and "letter" stories that started in the early sixties. If these stories are New Wave, some people are going to be surprised. Ballard, on the other hand, writes much of his work in beautiful prose (using the King's English the way it was originally meant to be used).

Anyway, before this gets too absurd, let me make my point. Trying to define Old Wave or New Wave is like trying to define science fiction itself. If definition were a requirement for existence, none of the above would exist. There is no satisfactory answer. A while back it was fashionable to try to come up with a definition of SF, but (after way too many words were wasted on the subject) most everyone has given that up. As soon as everyone gets done screaming about New and Old, it'll all be merely SF, whatever that is. All that this current arguing is doing for me is hindering my enjoyment of reading. I have to worry about whether or not my friend down the road who also reads SF will come after me with a gun if I tell him I liked *Stand on Zanzibar*.

If you don't like something you read, say so. But don't condemn it because it's New or Old Wave. Just because someone says that a story is a trashy, "conventional", Old Wave piece of writing doesn't mean you won't like it. The two greatest sins in the world are not reading something because you've decided you won't like it beforehand, and reading some garbage because you're a whatever-Waver and this is what you're supposed to like. Go into a story without any prejudices. Just because it's new or different doesn't necessarily mean that it will be good,

or bad.

Finally, I'd like to say that SF is much better today than it was six or eight years ago. The older writers have a more mature style to augment their imagination, and the new arrivals have some fascinating new ideas. There is much to be enjoyed by all, so let's enjoy, and stop arguing.

Spencer R. Lepley

CMR 159

Moody AFB, Georgia 31601

That about wraps it up for another issue. Remember, please, to type your letters, double-spaced, for publication here. It greatly increases your chances for getting into print, and eases the load on my tired editorial shoulders. —Ted White

(CONTINUED FROM PAGE 32)

Dellbar in awe.

"By no means! I mean that, having glimpsed as much of the underlying reality as you have, and as much as you can ever tolerate, you have exhausted the scope of purposive activity of your present personality. You, or your soul, will begin a new life in a new body. Graduation, as you call it, is several thousand lifetimes away for all you humans."

Dellbar's mind was a frantic whirl. How much of him was soul and how much was unsouled human? What would be left of him if his soul were pulled away? Not much, he was sure. Could he actually go on living in such a condition?

"What can I do with . . ." he began to protest, then he saw the screen had gone blank.

He shrugged. What was the point of arguing, anyway . . . especially over some nonsensical business about a soul, and with a character who had to be a figment of his imagination?

His trouble was that he had let that

demaned wench of his, Margitte, get him in such a stew that he was taking a bad trip without the benefit of acid. There were better uses for the visualizer than that. Why, hell, with this gadget he had invented he could become the richest man in the country! He could listen in on corporate board meetings, for instance, and get enough inside scoop to make countless killings in the stock market.

And as for women, he would be able to buy any woman he wanted, so what the hell!

But right now he was tired from working and worrying too hard. So, take it easy for a few days, and have some fun with his visualizer.

Dellbar went upstairs, made a pitcher of martinis, and returned with it to his workshop. He pulled a comfortable chair around to face the visualizer screen, poured himself a drink, relaxed, and tuned in a pornographic movie.

—Howard L. Myers

COMING NEXT MONTH

In the March, 1971 *AMAZING STORIES*—The novel everyone will be talking about *next* year, Hugo and Nebula Award-winner Ursula K. Le Guin's *THE LATHE OF HEAVEN*! This one *can't* be missed!

It is late August as I write this, and one week past the official "due date" for the birth of our first child. Such dates mean relatively little, of course—the tolerance is plus-or-minus two weeks—but the effect has been to hang us upon tenderhooks of endless suspense. Every activity has to be planned on a contingency basis—we'll do this and that, *if* the baby is not coming about then—and I find my mind wiped clean of appropriate science-fictional topics for editorializing.

Instead, I have been making moving plans.

The baby was pretty much the last straw that set these plans into action, although we have been thinking of leaving the city for years. I was raised in a semi-rural suburb of Washington, D.C., and my own biases are firmly fixed: I want my child to have the same opportunities, such as may still be available.

For that reason I shall be returning this fall to my old family home, in Falls Church, Virginia. I spent my first nineteen years in that house, and it is packed with nostalgic memories. When I was very young, it was surrounded by small farms, the local "street" was a pair of dirt ruts with grass growing inbetween, and I was frightened of the cows that roamed about. (If you want a fairly accurate description of the locale, I refer you to my story, "Only Yesterday," in the July, 1969 issue of this magazine.) To this day, the house (and my grandmother's neighboring house) is served by well-water that tastes sweeter and is far more pure than any city water in this land. They graded the street in the early forties,

when a subdivision called "Whitehaven" was put in across and down the way. As I grew up, the woods and fields continued to dwindle into newer housing developments, although not—thank God!—of the tract variety. Still, the family houses are surrounded by lawns, trees, a woodlot, and gardens—and it's a far cry from the streets of Brooklyn.

Returning to take over the house in which you grew up is a daunting task. Much of our planning has been for the rearrangement and redecoration of rooms, as much as possible to change their roles and create a "new" house in which to live. I could not, for instance, take over my parents' bedroom any more than I could return to the one that was mine for so many years.

I shall miss New York City—in which I've spent eleven years—and not the least of those features I shall miss is my local candy store, which stocks faithfully every science fiction magazine published, even the most obscure. A reader sent me a card not too many months ago from Falls Church to tell me that AMAZING and FANTASTIC were no longer available at the drugstore where he used to buy them. It was one of the same drugstores I frequented in my adolescence, and while I shan't personally care about finding my own magazines there, I have the crumbling feeling that I shall miss most of the others—something I've not once done in twenty years.

Then too, there's the simple task of moving. My collection is, I am sure, no where near as formidable as those of Sam Moskowitz or Forry Ackerman, but it is large, and includes not only

thousands of books and magazines, but over 2,000 records—which weigh a great deal more, proportionately. I expect to devote the next month to packing alone.

My move will not have much, if any, effect upon my editorship of these magazines. I shall be less than 250 miles away, and shall probably make frequent trips to this city, perhaps seeing my publisher as often as I do now. It does, however, seem unlikely that I will be able to continue designing and producing the covers—but I shall try to find a responsible and concerned person to take over that task. I think you will all agree with me that our present-day covers are a vast improvement over those of a year or two ago.

I hope that on my visits to New York City I'll be able to see most of the many friends I've known here, while my move back to the Washington area will allow me to renew old friendships there. I don't expect, however, that we'll be as involved in local fan-doings there, if for no other reason than the time required for work on the place and necessary in raising a new child.

In leaving the city here, I shall surrender the hosting of the Fanoclats, a club which was born in 1960, and founded by Richard and Pat Lupoff, Larry and Noreen Shaw, my first wife and myself. Dick was the club's first host, Lin Carter its second, and I've been hosting it since 1963. Its biweekly meetings were often my major incentive for housecleaning in my bachelor years (between first and second wives), and the club has probably been as fertile a spawning

ground for new writers in the field as any of the last decade, rivalling the old New York Futurians of the early forties. Members have included Bob Silverberg, Ajay Budrys, Terry Carr, Dave Van Arnam, Lee Hoffman, Chip Delany, Alex Panshin, Jack Gaughan, Gray Morrow, Mike Hinge, and no doubt any number of others I've momentarily forgotten who, when they find their names missing, will fire off an indignant letter to me.

But the club will not die. Steve Stiles, a charter Fanoclast (and an artist who had an illustration in the August FANTASTIC), is taking over our apartment here, and will inherit the Fanoclats as well. I'm convinced that the habit of meeting here on alternate Friday nights is so strong that Fanoclast meetings will go on no matter who takes the apartment in the years to come. In my mind's eye I can envision the horrible fate of non-science fiction tenants, besieged by sf-people every other week, ultimately surrendering and stepping aside to let a fan move in once again. Yes, the thought moves me; it really does.

Nostalgia overwhelms me at odd moments like this. Nostalgia for the home I shall be leaving, and nostalgia for the home to which I shall return.

In the meantime, here I sit, trying to write an editorial while, lurking always at the edge of my consciousness, I await my wife's voice telling me, "I think it's time to go to the hospital." We plan to use the Lamaze method of so-called natural childbirth, and I expect to be with my wife throughout. It's the sort of experience which, even

in contemplation, tends to drive other thoughts from one's mind. Therefore, please accept my apologies for a necessarily short and perhaps rambling editorial this issue.

Postscript: On 5:18 a.m., August

28th, early on a Friday morning, Arielle White was born into this troubled world at 7 lbs. 9 oz. It was a fine delivery, and mother and child are both doing well. Father seems a little harried.

—Ted White

(CONTINUED FROM PAGE 27)

had kissed her, because she couldn't very well stop them. And she had never been kissed like that. Maybe he could love her and she him.

"What is it?" Vince said.

"Perhaps a good enough basis for our life together," she whispered. "You need me, Vince."

—J.T. McIntosh

(CONTINUED FROM PAGE 115)

Ward, Box 41, Menlo Park, Calif. 94025; 8, 6, & 6 pp., respectively, offset. A West Coast newszine that is either folding or being turned over to someone else after #50. No more subscriptions accepted, but perhaps you could get these issues if you want.

*LOCUS 57-61, June-August, 1970; 10/\$2, 20/\$4; biweekly, from Charlie Brown, 2078 Anthony Ave., Bronx, NY 10457; 10 pp. each, including inserts, mimeographed. Acknowledged by many as the leading newszine. Better than the news reporting are the occasional columns by Bob Tucker and Harry Warner.

*SPECULATION #26, May, 1970, 40¢ or 5/\$2; irregular, from Peter R. Weston, 31 Pinewall Ave., Kings Norton, Birmingham 30, UNITED KINGDOM, 58 pp., mimeographed. In my opinion the best fanzine of science fiction discussion.

CYPHER #1, June, 1970; two for 4/-; irregular, from James Goddard and Mike Sandow, 1 Sharvells Rd., Milford on Sea, Lymington, Hants., SO 4 OPE, ENGLAND; 32 pp.,

mimeographed.

*HAVERINGS #44, March/April, 1970; 6/\$1; bimonthly, from Ethel Lindsay, Courage House, 6 Langley Ave., Surbiton, Surrey, UNITED KINGDOM (US Agent: Andrew Porter, Apt. 3-J, 55 Pineapple St., Brooklyn, NY 11201); 10 pp., mimeographed. Listing and commentary on the fanzines Ethel receives. This issue is marred by an amazing number of inaccuracies and pseudo-accuracies, but it's usually reliable, and Ethel has recently taken to including British news as well.

DYNACENCE #1, Spring, 1970; 35¢ or 3/\$1; monthly, from Michael Juergens, 257 Florence St., Hammond, Ind. 46324; 28 pp., mimeographed.

EMBELYON #1, May, 1970; 35¢ or 3/\$1; irregular, from Lee and Jim Lavell, 5647 Culver St., Indianapolis, Ind. 46226; 32 pp., mimeographed.

—John D. Berry

Fanzines for review should be sent directly to John D. Berry, Mayfield House, Stanford, Calif. 94305.

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
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
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